

COURSE MATERIAL

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Anttoni Lehto & Taru Penttilä (eds.)

PEDAGOGICAL VIEWS ON INNOVATION COMPETENCES AND ENTREPRENEURSHIP

Innovation pedagogy and other approaches



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CONTENTS

FOREWORD – THIS IS THE WAY <i>Harri Lappalainen</i>	5
AIMING AT INNOVATION EXPERTISE <i>Liisa Kairisto-Mertanen</i>	7
INNOVATION PEDAGOGY – A STRATEGIC LEARNING APPROACH FOR THE FUTURE <i>Taru Penttilä, Liisa Kairisto-Mertanen, Ari Putkonen & Anttoni Lehto</i>	11
RDI INTEGRATING THEORY AND PRACTICE <i>Ari Putkonen</i>	24
PEDAGOGICAL VIEWS ON INNOVATION COMPETENCES	
DEVELOPING INNOVATION COMPETENCES THROUGH BOUNDARY CROSSING IN A SOCIAL LEARNING ENVIRONMENT <i>Taru Penttilä & Liisa Kairisto-Mertanen</i>	34
ASSESSMENT OF INNOVATION COMPETENCE <i>Frances Watts, Amparo García-Carbonell, M^o Ángeles Andreu-Andrés, Christiane Stange & Helmut Helker</i>	44
WORKING LIFE FAMILIARISATION THROUGH HATCHERY ACTIVITIES <i>Meiju Räsänen & Sami Lyytinen</i>	57
THE PUZZLES AND PEARLS OF SITUATED LEARNING <i>Loes Houweling & Nienke Zijlstra</i>	65
NOISY KNOWLEDGE AS A PEDAGOGICAL CHALLENGE <i>Taru Penttilä & Ari Putkonen</i>	76

PEDAGOGICAL VIEWS ON ENTREPRENEURSHIP

ENTREPRENEURSHIP EDUCATION – AN INNOVATION SYSTEMS APPROACH <i>Hein Roelfsema</i>	88
PROMOTING ENTREPRENEURSHIP AT TURKU UNIVERSITY OF APPLIED SCIENCES <i>Ella Kasi</i>	100
BUSINESS ACADEMY – AN ENTREPRENEURSHIP-ORIENTED LEARNING ENVIRONMENT <i>Jaana Kallio-Gerlander, Jussi Puhakainen, Mikko Määttänen & Pyy Kunnas</i>	106
CHANGING ACTIONS THROUGH CHANGING STORIES <i>Zuleika Beaven & Jonathan Lawson</i>	114
AUTHORS	124

FOREWORD – THIS IS THE WAY

I confess.

I'm a believer in innovation pedagogy.

Why?

My career history includes two higher education institutions, working for an SME and over eight years as a full-time entrepreneur. In my experience, an entrepreneur doesn't necessarily need to be a jack-of-all-trades. For your own peace of mind, as well as the success of your business, it makes sense to focus on your strengths. For example when I was an entrepreneur, I outsourced all of my accounting and financial management.

Nevertheless, there are things that the entrepreneur cannot outsource, and I would like to highlight two of them here. The first is an understanding of how society operates and the ability to be actively involved in it with the help of various networking skills. The second key competence is operating in different types of work groups, when the people around you change, the working language changes from Finnish to English practically mid-sentence, other group members others halfway across the world and so on. International ad hoc teams are commonplace and working effectively in them requires practice.

I'm fortunate to have worked for a communications agency before becoming an entrepreneur. I say that because the Master's Degree programme I completed at university back in the day did little to prepare me for working in community or network-type settings. Group work was not particularly valued as a method of study, and direct involvement with working life was near sacrilege at the altar of pure scientific inquiry. Our studies were focused on absorbing knowledge (and I readily admit I've long forgotten the majority of what I was taught). Any skills I have needed in working life, I have primarily learned in working life. An entrepreneurial attitude can be employed also in paid labour, and indeed it is useful in that setting as well, especially now that even public sector jobs increasingly require participation in raising funds. The legendary Finnish entrepreneur Pentti Oskari Kangas was right on the money when he said "Attitude is key. Always."

In the university of applied sciences sector, I've heard concerns that, particularly when it comes to engineer training, emphasising interaction and networking skills would happen at the expense of hard content, thereby compromising the knowledge base of future engineers. Not to worry, brothers and sisters. Methods of study that activate students don't have to be used at the expense of content – on the contrary, they add depth and a practical dimension to content. It's high time that education moves towards a system where working life and the educational institution are part of the same closely connected community instead of being isolated from each other.

Over the past two years, I've had the opportunity to talk about innovation pedagogy at a number of international conferences in Europe and Asia. The feedback has been very encouraging. The goals of improving connections between studies and working life, and increasing internationalisation, are prominently on the agenda everywhere you look. I believe that a close-knit and active international development community can help us take significant strides towards realising the EU concept of the Knowledge Triangle – not just in individual study periods, but cross-sectionally throughout entire degree programmes.

This book is based on the Finnish-language article collection *Yrittäjyyden jäljillä, työelämän poluilla* (2012), but most of the material has been completely revised. There are also many articles written exclusively for this publication, which includes contributions by authors from all CARPE (Consortium on Applied Research and Professional Education) member organisations. CARPE is a strategic network of five European universities aiming at carrying out joint applied research and curriculum development in the field of professional education. The texts themselves are primarily targeted at staff members of universities of applied sciences as well as all the planners, developers and decision-makers partaking in activities relating to higher educational institutions.

Turku, October 2013

Harri Lappalainen

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Entrepreneur at Hanketaito Oy

AIMING AT INNOVATION EXPERTISE

Liisa Kairisto-Mertanen

Innovation pedagogy is a learning approach, which defines in a new way how knowledge is assimilated, produced and used in a manner that can create innovations.

The strategy of Turku University of Applied Sciences states that the university adheres to the principles of innovation pedagogy in its actions. Irrespective of the degree programme, the goal is the type of approach to one's own learning that enables participation in the innovation processes of future work organisations. Hence the minimum target is to acquire the knowledge, skills and attitudes required for innovative duties; the maximum target is to produce innovations already during the studies.

WHY INNOVATION PEDAGOGY?

It is estimated with reasonable certainty that work in the future will differ from the requirements of today's organisations. The young people currently in education will set different goals for their own future than the large generation at work today. Increasingly, graduates from universities of applied sciences will be working in positions where the worker is required to not only define the way of working but set goals for his or her own work. Routine tasks will decrease, and the employee must be able to define the ways to achieve goals independently.

The goals of the European Union to turn Europe into the world's leading information society have been supported in Finland by the innovation strategy published by the Finnish government. The success of innovation policies relies largely on education and, due to their regional obligations, in particular universities of applied sciences that have the ability to react quickly to influence changes taking place in their operating environment.

The duty of universities of applied sciences is to train skilled professionals for the needs of business and working life. The aim is that young graduates can leave education with the basic skills required for their occupation. In order to make this possible, the entire degree programme must be designed starting from the needs of working life – we talk about a competence-based curriculum that, already in its planning stages, tries to identify with those working life needs that graduates will be facing. This is why understanding the knowledge, skills and attitudes set as targets will create the foundation for the kinds of study modules that will be offered to the students during the studies. It is of utmost importance that cooperation between the different degree programmes and stakeholders of the surrounding world works well.

More and more frequently, the needs presented by working life relate not only to the occupation-specific competence contained within each degree programme but also to various other skills that are essential in working life. A common aspiration is to find “a good guy” that masters not only the core skills of the professions but also all manner of other interaction, behaviour and presentation skills that are almost without exception considered essential prerequisites for employment.

PREMISES OF INNOVATION PEDAGOGY

Innovation pedagogy developed at Turku University of Applied Sciences starts with the premise that innovation competences are part of every occupation. New basic requirements have been dressed into such competence forms that we believe will lead to an ability to participate in working life innovation processes. Each graduating student must naturally know the basic requirements of his or her own field but, in addition to these, must also have the knowledge, skills and attitudes that come in useful when the goal is to produce something new or at least apply existing knowledge in a way that creates something new. The aspired end result will be an expert that has the skills to produce additional value to his or her own field through innovative thinking and actions.

Education has traditionally relied on individual competence, and innovation has also frequently been seen as an activity of some independently working “propeller-head”. As the world is becoming increasingly complex and the amount of information is growing, it has become even more evident that only a few can vanquish the collective strength of a group by individual actions.

Interaction skills are important to help bounce one's own thoughts off a group for feedback and develop them this way into even better and more competitive ideas. The significance of good networks and networking has similarly become more important. Networks create safety when actions can be brought forward with people other than complete strangers. Networks complement the competences of those participating in them with the principle of mutual benefit.

The innovation competences selected as the educational targets of innovation pedagogy are divided into three classes. We believe that interpersonal and networking skills must also be generated in students, in addition to individual skills. We can reach the target by organising education so that it is implemented using bold and student-focused teaching methods. It is also necessary to allow students to work during education with each other in multi-disciplinary groups and authentic work-based research and development as well as service activities projects. The curricula must be flexible and enable individual student-specific choices. Internationalisation is an integral part of any education in the globalised world and entrepreneurship a noteworthy career choice, irrespective of degree programme.

INNOVATION PEDAGOGY BRINGS ADDED VALUE

The goal of innovation pedagogy is to produce added value. This is produced for the university itself, the student, working life and, finally, the entire society.

Society needs successful companies and other working life organisations. It is only through them that we can secure wellbeing in a situation of increased competition and insecurity. The success of organisations depends on employees who can create new solutions and are able to think innovatively. Understanding customer needs and translating them into solutions that bring added value are prerequisites of entrepreneurship. The limited Finnish market is often not enough to sustain businesses that must concentrate their competences on increasingly narrower sectors. We need language skills, market understanding and cultural awareness when we export Finnish products to foreign markets. Service innovations are needed as well. They help service organisations in modernising and improving their operations.

Innovation pedagogy enables a university of applied sciences to stand out from other universities. One of the duties of university of applied sciences relates to regional impact and cooperation with regional business and working life. The starting point of innovation pedagogy is that cooperation with working-life partners enables an integral educational duty: the students' ability to use the knowledge and skills they learn even in a wider context than where they have been acquired. It must be possible to use the learning acquired previously and apply it in similar yet new situations. The more similarities learning situations share with real situations encountered in working life, the more effectively the student's knowledge is transferred.

New learning methods and possibilities offered to students will attract students to the university. Innovation pedagogy allows Turku University of Applied Sciences to profile itself in a way that the students experience as producing added value to them. Innovation pedagogy is a real opportunity for the student to start building lifelong networks already during the studies through practical multidisciplinary learning situations; the degree can be completed as a multidisciplinary degree that allows the student to acquire individual skills that support his or her own professional career.

The flexibility of the education provides the student with plenty of free choices to direct his or her studies as he or she wants. Making a little effort and abandoning the easiest available route, the solutions of innovation pedagogy enable the graduating student to make his or her degree stand out from the masses. The student can start reaping the benefits of the added value acquired during the studies right from the start of his or her professional career.

INNOVATION PEDAGOGY – A STRATEGIC LEARNING APPROACH FOR THE FUTURE

Taru Penttilä, Liisa Kairisto-Mertanen, Ari Putkonen & Anttoni Lehto

INTRODUCTION

Universities of applied sciences, along with other higher education institutions, are under increasing societal pressure to respond to the rapidly changing requirements of working life. This has, and will, result both in large scale structural revisions in national higher education systems as well as the need to alter the targeted skill set of any individual student graduating from said institutions. The role of universities of applied sciences as flexible sources and disseminators of applied knowledge and expertise is growing on regional, national and international levels alike.

A fruitful environment for innovation consists of individuals with different backgrounds working together on the same problems. These innovation communities can be tight teams meeting every day or network-like, looser communities. The success of the communities is based on know-how and sharing knowledge as well as the ability to combine different points of view and approaches. Innovations are more frequently generated where different fields of expertise meet. Successful innovation policy calls for recognising and taking into account the pressures for change both in relation to the economy and the society. These pressures are created by globalisation, principles of sustainability, new technologies and the ageing population, among many others.

For Finnish universities of applied sciences, their obligation to serve regional working life directs them to engage in applied research and development (R&D) activities and environments. When Finnish universities of applied sciences are assessed, the applicability of R&D results in working life is among

the key criteria. That is why, in addition to mere theoretical knowledge, practical know-how as well as the ability both to recognise and solve problems should be emphasised in learning processes. As a result, continuous interaction involving and encompassing different fields of expertise and organisations becomes not only something to be encouraged, but a prerequisite for success. (Putkonen & Hyrkkänen, 2007).

Teaching, R&D activities and working life cooperation should form a solid and interactive whole that can respond to the constantly changing expectations falling upon universities of applied sciences. Combining knowledge related to innovation activities on the one hand and pedagogy on the other offers the much needed theoretical foundation for improving expertise-based competitiveness. This process is at its most natural in the collaboration between higher education institutions and working life. It also underlines the challenge innovation pedagogy aims to tackle by combining learning with producing and applying new knowledge.

The traditional view still held by many educational institutions is that students receive new information and skills as a student and only begin to apply what they have learned after finding employment. This is exactly the way of thinking innovation pedagogy seeks to topple, as creating innovations presupposes not only knowledge but also the ability to apply it. According to this approach, knowledge should be applied in creating innovations even while studying. In other words, knowledge should be accumulated and applied simultaneously. (Penttilä & Putkonen 2013.)

Innovation pedagogy refers to an approach to learning and teaching that corresponds to the needs of working life while emphasising R&D expertise. In the approach, learning and teaching methods are applied creatively and in a value-adding way so that the students take responsibility for their learning and actively strive to reach their learning goals. After graduation, the students are innovative and oriented towards various kinds of development tasks, which means that they have acquired, in addition to the expertise on their own field, innovation competences required by all working life environments. Innovation competences enable students to take part and contribute in innovation processes in these environments. With its built-in mechanism enabling students to apply their knowledge in practice already during their studies, one can say that innovation pedagogy picks up where traditional theoretical learning left off.

To compensate for the certain elusiveness of the term itself, this article looks at innovation pedagogy from three distinct points of view: pedagogical, methodological, and finally, strategic. It offers not only a single definition of the term, but many, reflecting its varying contexts from its pedagogical basis to its impact on society as a whole. Before looking at innovation pedagogy more closely, however, it is useful to touch briefly upon innovation in general.

ON INNOVATION

Discussing innovation activities falls under the umbrella of design science. Design science looks at processes that produce innovations and the artefacts that are generated in them. Within the context of design science, countless theories have been drawn up to explain the mechanisms through which innovations are born, applied and assessed. Most of these theories portray innovation processes as phased and possibly iterative by nature. For example, giving birth to an innovative new service, product or an innovation in an organisational or social context requires the ability to apply one's expertise step by step, phase by phase. (Järvinen 2004.)

There is no one and only way of defining an innovation. Rogers (2003) states that an innovation can be defined as an idea, object or a way of doing things that is considered new. According to him, an innovation does not have to be something new in absolute terms, but the individuals involved must consider and experience it as such.

A report by Sitra (2006) suggests that any organisation possessing excellent innovation abilities is able to constantly channel the creativity, know-how and all other resources of its personnel, service producers and customers to new solutions and innovations, which results in financial benefits. According to the report, it is of utmost importance to understand the systemic nature of any organisation – the way individuals and their expertise are linked to each other, and how they are able to create new functional combinations as well as more independent entities.

Additionally, innovations can be considered as radical or incremental (Tidd et al. 2001), or even as constant improvement. When discussing innovation pedagogy, Kettunen (2009) defines innovation as an idea utilised in working

life. To sum up the term in the context of innovation pedagogy, it can be stated that innovation activities are understood as processes of constantly improving expertise, which lead to new sustainable ideas, further expertise or novel practices applicable in working life.

INNOVATION PEDAGOGY AS A PEDAGOGICAL CHOICE

Like innovation, learning can also be defined as a process. In that process, behaviour changes as a result of experience. (Maples & Webster 1980.) In the context of learning approaches and the various researchers and schools working on them, the theoretical framework of innovation pedagogy is delineated by humanism, cognitivism, sociocultural approaches and collaborative learning. Innovation pedagogy also embraces the concept of knowledge as being largely based on intuition and tacit knowledge.

According to the humanistic view, a person is both the enabler and the ruler of their own future. In parallel to the cognitive conceptions with regard to learning, innovation pedagogy considers the active participation and construction of meaning by the learners themselves as bases for all learning. With the help of diverse learning environments, individuals are exposed to new dialogic situations that enable novel insights. Cognitivism is not a unified approach, as it can be seen to include situational learning, constructivism as well as experiential and critical leaning approaches, among others. What connects these points of view is their way of perceiving the surrounding world and emphasising the significance of the active individual in processing and constructing knowledge. (Poikela 1998)

In addition to the central role of the learner, innovation pedagogy promotes practical activities as well as creating, constructing and cumulating knowledge. Scientific knowledge facilitates solving practical problems, but sometimes a new practice born out of immediate need in a practically oriented situation results in a scientific breakthrough. Also in the field of learning theories in general, interplay between theory and the practices in which theories are applied can be increasingly observed. Through collaborative learning, different actors are able to work together in dialogue, in such a manner that their own expertise can be efficiently shared and combined in novel ways, resulting in something more than the sum of its parts. (Vygotsky 1982; Wenger 1998; Hakkarainen et al. 2001)

In addition to previously mentioned approaches, also dialogical learning and progressive inquiry support one of the central goals of innovation pedagogy: generating, refining and commercialising innovations in the context of higher education institutions. In dialogical learning, the activeness of the individual and their collaboration with other learners is highlighted, but there is also additional emphasis placed on the systematic nature and the concrete object of the process. Progressive inquiry, in turn, refers to internalising and deconstructing knowledge instead of simply devouring and merging it with everything that has previously been learned. (Hakkarainen et al. 2005; Paavola & Hakkarainen 2005.) These experiential and critical learning approaches underline the processual and phasic nature of learning, as well as its built-in need for constant assessment. Learners are guided to utilise and process their previous experiences while helping them cumulate new ones via diverse learning environments.

According to innovation pedagogy, learning cannot be separated from the surrounding world, as the cultural operating models always steer learners and their activities. The relating sociocultural theories (e.g. Vygotsky 1982) highlight the need to define the cultural toolkit and modus operandi of learning at a certain point in time and in a certain culture. The way we understand our surroundings and solve problems is greatly influenced by the typical activities in which we take part on a daily basis – a fact that places special emphasis on learning environments in which pedagogical methods are applied in practice.

INNOVATION PEDAGOGY AS A METHODOLOGICAL CHOICE

By using the framework of innovation pedagogy, it is possible to examine and develop teaching and learning methods that offer students enhanced professional growth as well as improved social skills to be employed in working life. Constant application of knowledge and skills deepens and accelerates learning. Innovation pedagogy does not begin with knowledge and move on to its applications, but new knowledge is applied even before it is adopted.

As previously mentioned, the core idea of innovation pedagogy is to bridge the gap between the educational context and working life. Learning and teaching processes are to be developed so that they provide improved competences for the students and enable personal and professional growth. Learning is deeper when previously-gained knowledge is continuously applied to

practical contexts. Creating new services, products and organisational or social innovations – new added value – requires both knowledge and skills, which are applied to an innovation process. (Gibbons et al. 1994; Kairisto-Mertanen et al. 2010; Nonaka & Takeuchi 1995; Nowothy & Gibbons 2001; Nowothy & Gibbons 2003.)

In today's society, it is important to be able to see the bigger picture, to be able to break free from established practices and to create something new. Discussing the concept of expertise in a satisfactory manner in such a context demands moving away from individual experts towards looking at communal expertise; then the concept widens its scope to include skills relating to the ability to combine, master and transform knowledge as well as problem-solving. (Haarala et al. 2008.) Formal education does not make an expert, as true expertise can really emerge only within a work community when solving practical problems. In such environments, learning becomes interconnected with the creation of new networks between the learner and the expert culture. (Hakkarainen 2000; Hakkarainen et al. 2004.) The one-way model of knowledge trickling down from the masters to the apprentices no longer holds true, but it is typical for present-day working communities to promote symmetrical knowledge. Symmetrical knowledge refers to a situation in which individuals have their own specific fields of expertise and where dialogue between these actors benefits all parties. (Hakkarainen 2005.)

As pointed out in the previous article collection on innovation pedagogy (Kairisto-Mertanen et al. 2011), the approach can also be extremely useful when rethinking learning environments, which according to innovation pedagogy are social and multidisciplinary. A learning environment is most frequently understood as the physical or virtual surroundings meant and built for learning purposes. In innovation pedagogy the social aspects of working and learning are emphasized and group processes where learning happens in multidisciplinary teams form an essential part of the whole process of learning. A social learning environment is formed by people with different talents and competences and by the interaction enabling collaborative learning. Equally, also the tasks in working life often require knowledge and skills which do not belong to the scope of a single discipline. (Penttilä & Kairisto-Mertanen 2012; Penttilä & Putkonen 2013.)

The core of innovation pedagogy lies in emphasising interactive dialogue between the educational organisation and students as well as the surrounding working life and society. Accordingly, its conceptual core can be divided, as Figure 1 describes, into three different spheres in parallel to the three major actor groups benefiting from innovation pedagogy (Penttilä et al. 2011):

- final learning outcomes, creation of innovations and produced capability to participate in diverse innovation processes – having primarily to do with students, who are expected to create innovations while affiliating with working life
- learning of innovation competences alongside with study programme specific knowledge, skills and attitudes – being mostly connected with working life, which provides students with ideal surroundings to acquire the competences needed in innovation processes and in future working life in general
- meta-innovations – referring to the necessary cornerstones needed for learning according to innovation pedagogy; the elements enabling innovation pedagogy to be applied, including methods of learning and teaching utilised in the learning processes by the faculty members together with the students enhancing both the creation of innovations and innovation competences.

Meta-innovations are essential requirements for innovation pedagogy to succeed, as they enable the emergence of the so-called cornerstones of innovation pedagogy in any learning environment. These cornerstones include innovative learning and teaching methods, cross-disciplinary learning environment/ boundary crossing, integrated and extensive research and development activities, flexible curricula, concentration of acknowledging the importance of entrepreneurship and service production as well as internationalisation in the level of research, development and student engagement. Meta-innovations contribute especially to the development of student's interpersonal and networking competences.

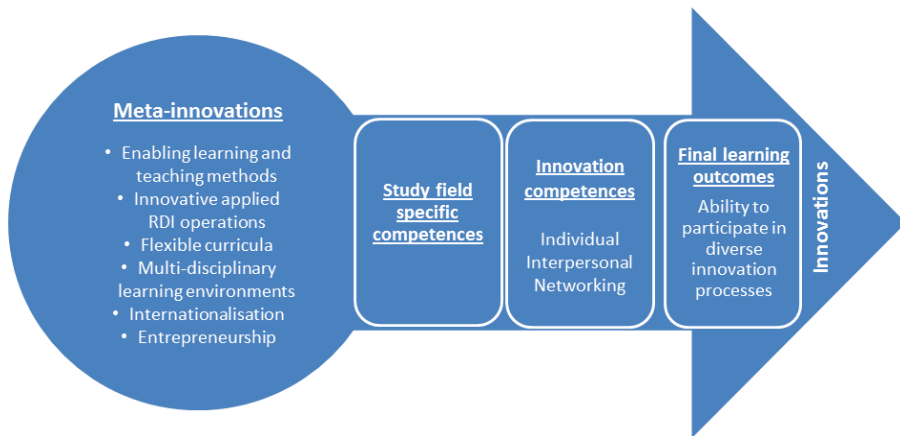


FIGURE 1. *Methods, objectives and learning outcomes according to innovation pedagogy.*

The methods applied and the way teachers and students interact constitute the basis for learning and thus enable the development of innovation competences. The methods used also facilitate intuitive and unexpected learning during the learning process and make transmitting of tacit knowledge possible when dealing with working life. In innovation pedagogy, these learning outcomes can manifest themselves in the format of intuitive and tacit learning, taking place in the learning situation. They can be e.g. experiences on cultural differences or on working with customers.

Innovation competences are learning outcomes that refer to knowledge, skills and attitudes needed for the innovation activities to be successful. The innovation competences drawn up at TUAS follow the European Qualifications Framework and comprise three levels: individual, interpersonal and networking competences. The individual level includes independent thinking and decision-making, target-oriented and tenacious actions, creative problem-solving and development of working methods as well as self-assessment and development of one's own skills and learning methods. The students are thus able to self-assess and develop their own skills and learning methods. The interpersonal level focuses on the abilities to co-operate in a diversified team or working community, to take the initiative and to work responsibly according to the targets of the community, to work in research and development projects by

applying and combining knowledge and methods of different fields, to work along the principles of ethics and social responsibility as well as to work in interactive communication situations. Finally, the networking level covers the abilities to create and maintain working connections, to work in networks, to co-operate in a multidisciplinary and multicultural environment as well as to communicate and interact in an international environment. Innovation competences are learned gradually as new information is added to our knowledge structures. (Kairisto-Mertanen et al. 2012.)

CONCLUSION – INNOVATION PEDAGOGY AS A STRATEGIC CHOICE

The operational environments of higher education institutions all around the world are under constant change. The rate of this change accelerates at a speed never seen before. Internet has brought knowledge and information within the reach of anybody having access to the network. Every possible piece of information needed for educating high level professionals can be found in the Internet. However, education institutions still tend to educate students with traditional methods originally designed for a world that is stable and mainly emphasises the learning of explicit knowledge. Methods better suited for a constantly changing world focus on activating students in learning and also include unofficial situations and contexts.

In all areas of knowledge creation, demand for a broader perspective is increasing. We are facing issues and challenges in creating added value needed to maintain our level of welfare, which are becoming increasingly difficult to address within the framework of a single method, be that a discipline or a profession. At the same time, we are very well aware of the fact that knowledge is at the heart of innovation and that innovation typically emerges at the boundaries of different knowledge domains. The economy and the success of future enterprises is more and more based on innovations, which are created by innovative employees capable of not only inventing something new by themselves, but also of participating in the processes where new solutions are created by working together. Interaction and networking are becoming invaluable parts of any expertise.

What this practically means is that innovation competences should be set as a goal of education in all disciplines. A new way of approaching things and ideas is something that can guarantee success not only for the individual student but also for the whole society, enterprises, other working life actors, students and the university itself.

Innovation pedagogy is a strategic choice, which requires understanding and agreement on setting said goals. In Turku University of Applied Sciences, it represents a philosophy that permeates through the entire organisation, and is visible in all activities. Innovation pedagogy offers a name to the development of our student's competences, enabling them to participate in the processes of creating innovations. Even though these competences are different from the traditional ones, it does not mean that the old study programme specific competences should be abandoned. However, we cannot leave students to cope by themselves without having put special emphasis also on equipping them with all the essential tools for the future. In innovation pedagogy, innovation competences represent a new sphere of know-how. By cultivating research and development activities in multidisciplinary environments we can make a significant contribution to the creation of regional, local and international innovations.

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RDI INTEGRATING THEORY AND PRACTICE

Ari Putkonen

INTRODUCTION

As an organisation with close connections with local working life, Turku University of Applied Sciences (TUAS) has several avenues to impact the development of regional companies and organisations. When interaction in the so-called knowledge triangle – between working life, education and research, development and innovation activities (RDI) – is active, new innovations are created. This article first reviews the RDI activities of TUAS from the perspective of different stakeholders and subsequently describes the factors prevailing in these interaction relations as a system, which reveals more of the role of RDI activities in integrating theory and practice. RDI activities can simultaneously produce both deeper learning and solutions for working life development needs.

COMPETENCE REQUIREMENTS

TUAS trains new experts and carries out applied RDI activities arising from working life needs. This obligation challenges us to operate in environments where knowledge is applied in authentic working life situations and competence assessed through concrete results. This almost invariably involves demanding development needs that require multidisciplinary skills. These include, for example, the development of new products, services, materials, processes, methods and systems, or reforming existing ones.

The ability of a university of applied sciences to produce new experts and solutions for working life requires that its own intellectual capital (Ojala 2008) is soundly established. Human capital consists of the competences of personnel and students, practical working life knowledge, the ability to identify and solve problems as well as values, attitudes and interaction skills. These are basic requirements for successful cooperation with businesses and organisations. Faculties built on cooperation between different fields of study, cooperation between faculties, international RDI activities as well as future-oriented RDI programmes and research groups represent the structural capital of the innovation activities of universities of applied sciences, which creates a good basis for meeting working life challenges described above.

At a national level, Finnish businesses find it increasingly difficult to introduce their products to international markets in ever-increasing competition. Businesses need new experts and RDI cooperation for the development of their products and services. A university of applied sciences, on the other hand, appreciates businesses' views on directing its RDI activities and ensuring the topicality of educational content. Cooperation and dialogue of this kind naturally strengthen the relational capital of both actors.

THEORY AND PRACTICE MEET IN AN IDEAL LEARNING ENVIRONMENT

TUAS develops innovation pedagogy, a comprehensive learning framework that promotes cooperation between education, RDI activities and working life. We believe that the long-awaited new vision on developing learning-based competitiveness of businesses can be achieved by combining pedagogic competence and knowledge relating to innovation processes. The underlying idea is to improve students' innovation skills throughout the studies, so that they will have the ability to meet the development challenges of working life and participate openly in innovation work when they enter employment after graduation. However, this requires solid cooperation between working life, teaching and RDI activities that jointly supports students' professional development.

Traditional thinking places the responsibility of education on providing students with the theoretical skills to begin with, which they can subsequently apply in practice. The development of these theoretical skills is continuously and systematically evaluated in universities of applied sciences, for example in the form of examinations. Does this mean that universities of applied sciences are more interested in achieving theoretical skills than application skills, since it does not test its students' application skills as thoroughly as theoretical skills? This should not be the case, because professional development requires the learning of both theoretical and application skills (Tynjälä 2002).

An ideal learning environment for professional development, therefore, is such where theoretical and practical knowledge and multidisciplinary interaction between actors are constantly present. More of such learning environments are needed, so that there would be no gap between theoretical knowledge and application skills required to solve real problems in working life.

JOINT NETWORKS OF WORKING LIFE AND UNIVERSITIES OF APPLIED SCIENCES

According to the model of networked culture, the connection between education and working life should be embedded in the definition of the basic task, structures and curricula (Nykänen & Tynjälä 2012). The foundation of good connections between businesses and other organisations and universities of applied sciences is good interpersonal relations. Official forms of cooperation include advisory boards and RDI project steering groups that regularly discuss topics relating to both education contents and RDI targets. This interaction impacts the operations of universities of applied sciences – initially as silent information that possibly manifests as decisions and choices concerning learning and RDI work. Learning contents are designed jointly with working life, but joint implementation of learning in Finland still largely relies on the internship periods.

Our research indicates that students' internships and final theses are the best known and most popular form of cooperation between working life and the university of applied sciences (Helmi 2010). Students are able to produce a

large number of new problem-solving ideas in a short time, particularly in a multidisciplinary group. Assigning development tasks to students is a good start for a deeper and longer-term cooperation with the university of applied sciences that also provides a natural way for potential new employees to get to know businesses.

A university of applied sciences gives businesses the possibility for long-term innovation collaboration. TUAS is an active participant in the national Strategic Centres for Science, Technology and Innovation (SHOK) programmes, which are aimed at creating new innovations. We are currently shareholders of FIMECC Oy (metal industry), DIGILE Oy (ICT industry) and RYM Oy (construction industry), and we also participate in implementing research programmes with CLEEN Oy (energy industry). The role of TUAS in the SHOK programmes is also to support small and medium sized enterprises in their participation. Additionally, we act as RDI partners for businesses in several SHOK research programmes. We have recently observed that, thanks to these numerous networking opportunities, there are more and more forerunner businesses and organisations appearing at the campuses of the university as well.

SYSTEMIC MODEL OF THE RDI OPERATING ENVIRONMENT

Complex dynamic systems are difficult to conceive and manage. The systemic approach (Senge 2006; Sterman 2000) may give new insight into how a complex system is structured and behaves. Systemic thinking is increasingly applied to designing new operating models in the private and public sectors. The systemic thinking model presented in Figure 1 presents causal relationships in RDI activities from the perspective of working life and education. The purpose of the model is to illustrate the factors influencing cooperation relationships and evaluate their role in terms of a work-focused and networked operating culture.

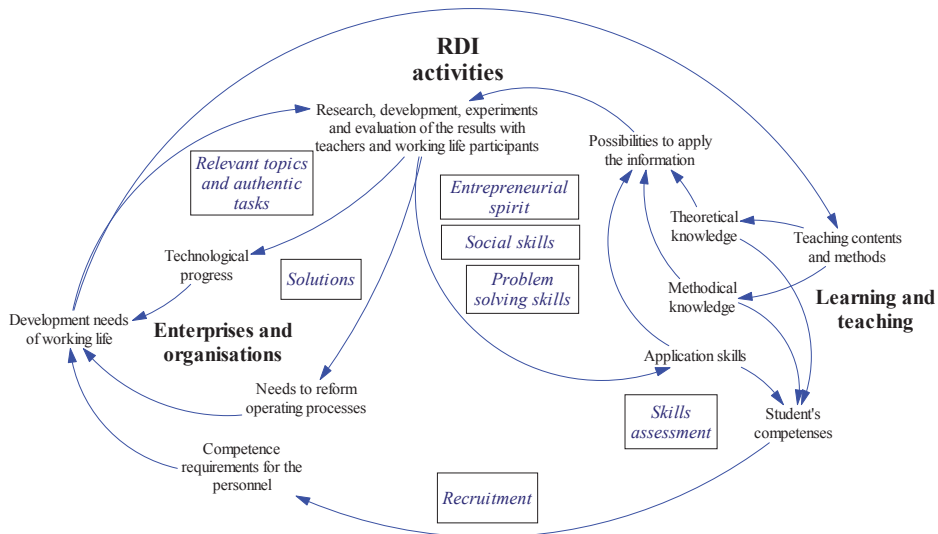


FIGURE 1. *Systemic thinking model on relationships between working life, education and RDI activities.*

Impetuses for working life development needs often include technological progress and a need to reform operating processes or personnel competences. Universities of applied sciences see working life development needs as an important source of information for helping our RDI aims as well as teaching contents and methods to maintain their relevance.

RDI activities thus provide solutions and perhaps even new innovations for working life, while students' application skills develop at the same time. Participating in solving authentic work-based development tasks and evaluating the results together with teachers and working life representatives effectively develops their problem-solving and social skills as well as entrepreneurial spirit. Teachers are also given the opportunity to evaluate students' skills in an authentic learning environment and draw conclusions on how well learnt theoretical knowledge is applied in practice. Theoretical and methodical information and their application skills offer students competences that facilitate their recruitment in businesses and organisations.

INTERNAL AND EXTERNAL EFFECTIVENESS OF RDI ACTIVITIES

Students already have ample opportunities to participate in RDI activities carried out with businesses and organisations. Students at Turku University of Applied Sciences gained approximately 86,500 credits in 2012 through practical assignments, theses, final projects and project activities relating to RDI activities. The supply does not yet, however, meet the demand well enough, because the structure of the curricula, the timing of teaching and the day-to-day learning environments do not yet favour practising application skills as much as they should.

The effectiveness of RDI work at TUAS is reviewed in stakeholder surveys aimed at advisory boards, the board and the delegation. Businesses' views on RDI cooperation and its possible barriers were reviewed in 2011. Participants' satisfaction with RDI projects was examined through a project effectiveness survey in 2008, 2009 and 2010. The mean in the latter survey among the 27 working life respondents who participated in RDI projects was 4.37 (on a scale of 1–5), where grade 5 was equivalent to very satisfied.

One factor complicating the evaluation of effectiveness is that although some of the effects of RDI activities are immediate, most can only be evaluated after a longer period of time. The immediate effects are often established from project outcomes. We have over 500 working life contacts relating to RDI projects every year. The substantially increased number of credits accumulated from RDI projects demonstrates in itself the students' and teachers' active participation in RDI work.

One way of evaluating the effectiveness of RDI activities in the long term are financial indicators. The RDI activities of TUAS have increased considerably in the last ten years. Their total volume in 2012 was approximately 12 million euros, of which 6 million euros were covered by tendered external income. These numbers prove that our working life partners and financiers in Finland and Brussels value our work.

INNOVATION PEDAGOGY AND ENTREPRENEURSHIP

Currently, the objective to integrate education and RDI work, as well as the related implementation methods, is talked about more and more. Partly in the same context, there has also been discussion on how entrepreneurial spirit could be awakened among students and how aspiring entrepreneurs could be trained in educational environments. This discussion has been productive, and new learning environments based on team working have been created – some of which are also presented in this publication. *BisnesAkademia* in Salo is a good example, where teams carry out customer projects as cooperatives. This kind of a curriculum that produces working life competences features embedded teaching, learning and guidance in authentic learning environments, where the processes of teachers, students and working life representatives become closely knit.

Innovation pedagogy provides an excellent framework for developing such learning environments where theoretical and practical knowledge meet and interaction between different actors is ongoing. In practice, these kinds of meetings take place organically in RDI work, linked to development needs arising from working life. Such an environment combines the students' theoretical knowledge with learning problem-solving skills and improving professional competence. The book at hand contains ample examples of successful experiments and implementations in innovation pedagogy. The reader can compare other articles with the systemic thinking model presented in this text on the relations between working life, education and RDI activities, and reflect upon how these network dynamics could be further developed.

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PEDAGOGICAL VIEWS ON INNOVATION COMPETENCES

DEVELOPING INNOVATION COMPETENCES THROUGH BOUNDARY CROSSING IN A SOCIAL LEARNING ENVIRONMENT

Taru Penttilä & Liisa Kairisto-Mertanen

INTRODUCTION

In all areas of knowledge creation, the demand for a broader perspective is increasing. The modern world faces issues and challenges that are becoming more and more difficult to address within the framework of a single method, be that a discipline or a profession. A boundary crossing approach for instance in problem-solving, service or product creation, research or in organisational teamwork enhances creativity. As a result, new previously unthinkable ideas are more likely to occur.

Cross-disciplinary collaboration is being promoted in academic and professional circles as an important strategy for developing new avenues of scholarly inquiry and for generating knowledge that is immediately applicable to the resolution of the real-world problems. (Wall & Shanka, 2008).

There are several reasons why we should look beyond the traditional boundaries. Such an approach is beneficial not only to education, but boundaries ought to be crossed in wider contexts as well. "Knowledge must be shared and applied to an organisation's products and services. The sharing and application of knowledge provides the competitive advantage" (Alberts 2007). The result concerning experiences in boundary crossing is to get something that is more than the sum of its parts, something different, a metaperspective according

to the research conducted by Wilson and Pirrie (2000). Combining different views, areas of knowledge or expertise is a potential source of extremely creative ideas.

The way people work is expected to undergo big changes in the future. Accordingly the requirements set for employees are changing. The number of people performing activities which could be described as not-by-the-book kind of working is increasing. Also in the future it will as valuable to be an expert in something as to know how to benefit from the expertise of others. These changes reflect changes in the working life structures which must be taken into account also when rating the competence of future graduates.

Education in the different universities in Europe becomes crucial when aiming to achieve any kind of changes. In this article, we focus on innovation competences provided by innovation pedagogy and on how they can be seen as an interactive continuum between the educational organisation, students and surrounding working life and society, forming a social learning environment. We offer practical examples of how boundary crossing is essential for innovation pedagogy to achieve its goals. We believe that innovative solutions are created through social learning in diverse surroundings, and discuss the nature of boundary crossing in higher education.

LEARNING OUTCOMES IN INNOVATION PEDAGOGY

Learning outcomes are statements used to describe specifically what is expected from a learner in terms of understanding, knowledge and know-how at the end of a certain period of learning. They are broad statements of what is achieved and assessed at the end of the course of study. (Harden, 2002; Buss, 2008). They represent an approach to education in which decisions about the curriculum are driven by the outcomes the students should display by the end of study modules. In outcome-based education, product defines process. From this point of view, the curriculum is developed according to the outcomes students are desired to demonstrate rather than drawing up objectives for a curriculum which already exists. In other words, a learning outcome is a written statement of intended and/or desired outcome to be manifested by student performance. (Spady 1988; Harden et al. 1999; Proitz 2010). Guidelines for defining learning outcomes recommend that they should be clearly observable and measurable (Buss, 2008).

The outcomes cover both cognitive and practical skills (Davies 2002). A certain learning outcome is divided into components consisting of cognitive, psychomotor and affective domains. They can be called knowledge or understanding, skills and attitudes, feelings and motivation, accordingly. As Spitzberg (1983) points out, the distinction between knowledge, skills and motivation is important, because performance can be enhanced or inhibited by any one or all of these components. Learning outcomes are also guaranteed achievements which can be institutionalised and incorporated into practice. The ownership of the outcomes represents a more student-centred approach, in which students take responsibility for their own learning. (Harden, 2002). It is argued that learning outcomes might not be suitable for every discipline of education, but literature also speaks of emerging learning outcomes – thus there is room for those that differ from the predetermined, intended learning outcomes and also cover unexpected, occasionally occurring learning. (Hussey & Smith 2008; Buss, 2008; Brady 1996)

The learning outcomes of innovation pedagogy are called innovation competences. A competence can be a feature of an individual, a group, a working community or an organisation (Weinert 2001; Ruohotie 2004). A competence can less and less frequently be described as a feature of an individual, because it is often based on expertise of collaborative teams and networks (Ståhle & Wilenius 2006). Competences are holistic, i.e. knowledge, skills and attitudes are interconnected and integrated (Bowden & Marton 1998). A competence can also be described as a dynamic process; it can be used, developed and changed. It is best developed in a learning process where people themselves participate into the development of their own work. Maintaining a competence requires a working environment that demands continuous learning and encourages professional growth. (Hildén 1999; Ruohotie 2002)

To sum up, innovation competences are the learning outcomes that refer to knowledge, skills and attitudes needed for innovation activities to be successful. As a result of development work spearheaded by Turku University of Applied Sciences, three categories of innovation competences were defined:

- 1) individual innovation competencies
- 2) interpersonal innovation competences
- 3) networking innovation competences.

The defined innovation competences thus cover generic individual competences and also generic interpersonal and networking competences, following the guidelines presented by European Qualifications Framework.

Individual innovation competences include

- independent thinking and decision-making
- target-oriented and tenacious actions
- creative problem-solving and development of working methods
- self-assessment and development of own skills and learning methods.

Interpersonal innovation competences focus on the

- ability to co-operate in a diversified team or working community
- ability to take the initiative and to work responsibly according to the targets of the community
- ability to work in research and development projects by applying and combining knowledge and methods of different fields
- ability to work along the principles of ethics and social responsibility
- ability to work in interactive communication situations.

Networking innovation competences cover the

- ability to create and maintain working connections
- ability to work in networks; ability to co-operate in a multidisciplinary and multicultural environment
- and ability to communicate and interact in an international environment.

Innovation competences are learned gradually as new information is added to our knowledge structures.¹ Knowledge acquisition and application are critical components in this process. The core idea in the application of innovation pedagogy is to bridge the gap between the educational context and working life. Learning and teaching processes are developed so that they provide improved competences for the students and enable personal and professional growth.

1 When analysing these skills, the question inevitably arises: how can we know that the methods chosen will generate the desired results? To provide a solution, Watts et al. discuss the Innovation Competencies Barometer developed in the INCODE project later in this publication.

IMPLEMENTING INNOVATION PEDAGOGY THROUGH BOUNDARY CROSSING

The concept of boundary crossing lacks a single comprehensive term, which would bring together all its variations, such as multidisciplinary, interdisciplinarity, transdisciplinarity. However, all these areas share the same goal of producing something new, unexpected and innovative through collaboration of people with different backgrounds. Each individual involved in this type of co-operation contributes his/her knowledge, history, experience, intuition, expertise, know-how and creativity to the social learning environment. The attitudes which the participants possess are significant to the effectiveness of boundary crossing collaboration, as “the crucial aspect is the involvement of participants who are ready and willing to learn from other disciplines” (Wall & Shankar 2008). Participants who are very defensive of their own ideas and knowledge base tend to harm the collaboration by not opening up to differing thoughts, and therefore innovative solutions through mixing different areas of knowledge might not be fostered. “Facilitating conversation from multiple disciplines is a tough job, requiring not only awareness of one’s own disciplinary bias but also the ability to manage power dynamics among highly successful and often egoistic participants” (Stober 2011). Thus leadership plays a key role in building a social learning environment that leads to positive results.

To understand the language of other disciplines takes time. In general, as the world of knowledge is very diverse indeed with contradicting views, terms and ideas, boundary crossing collaboration requires a setup where these differences are discussed and perhaps even solved. “Differences in research methods, work styles, epistemologies must be bridged in order to achieve mutual understanding of a problem and to arrive at a common solution” (Thompson Klein 2004). As Ratcheva (2009) concludes, integrating a team’s capabilities depends as much on the individual abilities to work together as they do on the expertise and skills of individuals. Communication is maybe the most important factor, as beneficial communication also helps to avoid the accumulation of new social problems and brings collaboration closer to its goals at the same time. “New way of working cannot simply be imported to the team but it can only emerge and develop through intense interactions” (Ratcheva, 2009).

According to Max-Neef (2005), educational institutions should shift their focus on improving boundary crossing collaboration for example by offering courses that are really multidisciplinary. “Interdisciplinary education exposes students to research in multiple disciplines, trains them in collaborative methods through team research and promotes new forms of communication and collaboration among disciplines” (Graybill et al. 2006). The aim of innovation pedagogy is to generate environments in which competitive advantage can be created by combining different kinds of know-how, since in a multidisciplinary environment, it is possible to evoke regional innovations and increase entrepreneurship through research and development. Also the transfer of knowledge from university environment to actual working environment becomes more efficient. In the end, one of the biggest challenges for innovation pedagogy is actually to teach the students to get comfortable with uncertainty and not to be afraid of leaving behind familiar ground.

BUILDING A SUCCESSFUL SOCIAL LEARNING ENVIRONMENT FOR BOUNDARY CROSSING

In working life, problems are solved and innovations are created in groups and networks. However, in universities the students traditionally study via lectures and reading. Collaboration in learning is not appreciated and sometimes even forbidden. Educational research has noted the transfer problem where learning cannot often be recalled and applied in working life (Illeris 2009). Learning in one type of setting is not necessarily accessible when the learner is moved to another setting. This problem can be, at least in part, avoided by creating identical elements in education and working life. (Kettunen 2009; Kettunen 2010; Kettunen 2011). In working life, there usually are people from many different disciplines who are expected work effectively together. Equally, also the tasks in working life many times require knowledge and skills that do not belong to the scope of only one discipline. Boundary crossing during studies is one of the means to solve the transfer problem. When students get used to working with people from different disciplines and learn to accept that they have to be interested in subject matter belonging to many different disciplines, the transfer of knowledge at work place becomes easier.

When encouraging students in boundary crossing by applying innovation pedagogy, Turku University of Applied Sciences utilises educational research, development and innovation projects. There are several different ways of carrying out these projects. The projects combine real life assignments, peer counselling and working in cross disciplinary groups, including the international aspect in all work. These projects also include different types of hatcheries.² The principles of carrying out the work in the hatcheries are approximately the same, but the expertise level of student varies according to the hatchery type. A first-year student is capable of handling less complicated assignments requiring not so much expertise, whereas a third year student has more, often individual, skills to be used when participating in the hatchery work.

When innovation pedagogy is applied, it is essential to give the students several opportunities to engage themselves in different kinds of hatcheries during their studies (Figure 1). Junior project hatchery forms the base and introduces the capabilities needed for this type of studying and working. After that it is up to the student to choose between different available options.

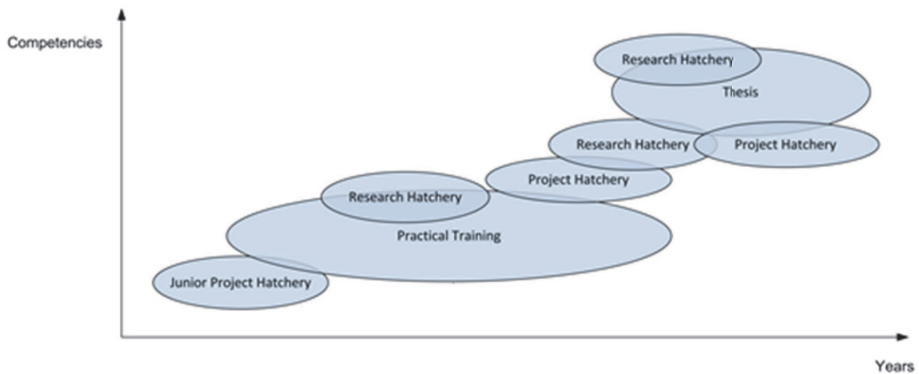


FIGURE 1. *Hatchery work throughout the degree.*

2 Räsänen & Lyytinen discuss hatcheries in detail later in this publication.

The research hatchery is meant for the students who have completed their basic studies and, as a result, are familiar with the basic methods of the field and have thus reached an appropriate level of general knowledge on the topics of the more advanced hatchery. The students may also have experience of project activities when they get involved with the research hatchery. (Lyytinen 2011)

Both the research hatchery and the advanced project hatchery are essentially content-orientated. In other words, their target learning outcome relates to the subject matter itself. The difference between the research hatchery / the advanced project hatchery and the junior project hatchery is at its greatest in this context – in junior project hatcheries the orientation is towards methods rather than substance.

Practical training is a compulsory part of the education in a university of applied sciences, and it always takes place out at the workplace where contacts to real working life are natural. Thesis work is another compulsory part of a university degree, and it is preferably accomplished in close co-operation with the working life. Research hatcheries bring the research done at the university to the proximity of every student. A student can participate in a research hatchery several times during the studies while moving from less complicated tasks to more complicated ones. Advanced project hatcheries bring the working life problems to the students. They offer a great and easy access point to the surrounding environment and make it possible for the students to start building networks with working life partners already during their studies.

IN CONCLUSION

Innovation pedagogy is a learning approach which can bring substantial benefits to the student, to the university, to the society surrounding the university and finally to the whole economy. In the future, there will be a need for professionals who are capable of defining their goals and means to achieve those goals by themselves. A lot of personal initiative is required. It also seems obvious that not only individual knowledge is valued, but instead people are required to build networks and interact in them to find the lacking pieces of information from different experts in their personal network. All this calls for an ability to expand one's connections to areas totally different from one's own background. This kind of boundary crossing will be something that can help future experts and their organisations to succeed.

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ASSESSMENT OF INNOVATION COMPETENCE

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Christiane Stange & Helmut Helker*

INTRODUCTION

The call in the working world for people capable of producing innovation has led institutions of higher education to shuffle to meet the challenge. Curriculum planning and design should now include innovation competence among its learning objectives and intended outcomes, which in turn should give way to the selection of teaching methods and assessment tasks that will lead to the expected outcome.

“Innovation” means different things to different people. For some, it is the introduction of a novelty, something radically new, an idea, a method, a device, an invention. For others, innovation is the improvement of something that already exists. For still others, that something new or improved must be useful to people, or organisations, and meet their needs. In other words, innovation has an inherent social dimension that makes it transcend mere invention or enhancement of a product or process. The competence for innovation in its diverse facets can thus be considered a cluster of separate, at times overlapping, competences, capacities and skills, which all together can be regarded as innovation competence.

The development and assessment of innovation competence in students confronts teachers with unique decisions concerning teaching and learning methodology and how to assess the results of classroom efforts. Four European universities¹ have joined forces to test the effectiveness of Research Hatchery as an active learning methodology (described by Räsänen & Lyytinen in this volume) and give shape to an instrument that will aid in the development and assessment of innovation competence in a higher education setting. The venture also comprises a plan for training teachers to use the criteria, which the partners have named Innovation Competencies Development (INCODE) Barometer.

THE INCODE BAROMETER

In keeping with the definition of innovation competence, the INCODE Barometer is a series of performance indicators that considers three dimensions of capacities and skills: individual, interpersonal and networking. To define the construct, the items were initially extracted from in-depth interviews with three human resource managers from different firms well known for their innovation. The items were expanded after meeting with a focus group of 12 academics and were then revised taking into account the nine generic competences defined by the Accreditation Board for Engineering and Technology (ABET).

The ABET competences were adopted in the Assessment of Higher Education Learning Outcomes (AHELO) initiative of the Organization for Economic Co-operation and Development (OECD) and have been described by many authors (McGourty et al. 2002; Parsons et al. 2005; Passow 2012; Shuman et al. 2005; Villa & Poblete 2007; Marin et al. 2011 & 2013; Penttilä & Kairisto-Mertanen 2012; Montero 2013; Watts et al. 2013). For the INCODE Barometer, a thorough review of the literature on innovation and innovation competence was carried out.

1 Turku University of Applied Sciences (Finland), Universitat Politècnica de València (Spain), University of Applied Sciences Hamburg (Germany) and Karel de Grote-Hogeschool Antwerpen (Belgium), in Project 518132-LLP-1-2011-1-FI-ERASMUS-FEXI of the European Union.

The INCODE Barometer is a scoring rubric to assist teachers and students by providing clear content focus and criteria for performance as well as a tool for self-assessment and peer feedback. The scale of the rubric includes a range of possible performances. The literature on the optimal number of response points on a scale is varied. Churchill & Peter (1984) concluded that the more scale points used, the more reliable the scores would be. However, studies carried out by Bending (1954), Preston & Colman (2000), Hofmans, Theuns & Mairesse (2007), and Contractor & Fox (2011), among others, confirmed that reliability is largely independent of the number of response categories.

There is no consensus in the literature on what scale works best, since different scales may be more appropriate for different purposes and raters, as Cox (1980) has asserted. A three-point scale can be quick and easy to use, although it may not allow raters to express their viewpoint adequately (Preston & Colman 2000). A five-point scale is simple to read; nevertheless, a ten-point format can also be useful, as many people are familiar with the notion of rating on a scale of ten (Dawes 2008).

As can be seen in Table 1, the INCODE Barometer offers a choice of scale, with points 1–10 and a category for *Not observed* or *Not demonstrated*, as well as five descriptors of behaviour, which in effect adjusts the scale to five points. The INCODE Barometer can similarly be adjusted to a three-point scale in order to fit the purpose and context of use, considering that “using more points than subjects can handle will probably result in an increase in variability without a concomitant increase precision” (Friedman & Amoo 1999, 188).

Regarding position, researchers traditionally present the positive descriptors of behaviour first in the scale and the most negative ones last. However, studies carried out by Friedman, Herskovitz and Pollack (1994) and some years before by Friedman, Friedman and Gluck (1988), proved that placing favourable descriptors on the left side of the scale made responses shift toward the most advantageous levels of fulfilment (in Friedman & Amoo 1999). For this reason, in the INCODE Barometer, possible performances are arranged from low achievement on the left to high achievement on the right side of the scale.

The INCODE Barometer can also be used in self-assessment for formative purposes to engage students in directing their own learning through reflection on what innovation competence entails. Likewise, providing the opportunities for peer assessment within the process of learning in a course encourages collaborative learning and helps students learn to give and receive feedback. The INCODE Barometer can be used by the teacher from the design phase of a course to the different activities of formative assessment throughout the course and of summative assessment in which decisions must be made regarding the achievement of learning objectives and the awarding of final grades.

TRAINING TO USE THE INCODE BAROMETER

The INCODE Barometer was constructed to evaluate student development and performance in the complex cluster of innovation competence. The overall assessment design should therefore include a training program for raters to be able to apply the Barometer consistently. Raters typically are teachers, students or student peers who wish to assess learning outcomes during and after the use of active learning methodologies, such as research hatchery. In peer and self-assessment, student raters should be able to recognise the performance of other students and their own. For students to have differentiated feedback and for raters to produce the most reliable ratings, it is necessary to practice the use of the instrument in advance. Therefore, special training is recommended, which builds on findings of several studies that suggest that combinations of different training methods tend to yield the most effective results (Roch et al. 2012; Bernardin & Pence 1980; Sulsky & Day 1994; Thornton & Zorich 1980).

To train raters, three training approaches are proposed. Behavioural Observation Training (BOT) gives raters the opportunity to become familiar with the complexity of observation processes. Rater Error Training (RET) instructs raters on common rater errors and how to avoid them. Finally, Frame of Reference Training (FOR) allows raters to become acquainted with relevant behavioural indicators of innovation competence with examples that have been aligned with the specific context in which the assessment is to take place.

Due to the combination of the different training models, rater training in the use of the INCODE Barometer needs more than five hours' time. Shorter training sessions have proven to be ineffective and showed no consistent results (Congdon & McQueen 2000; Hoyt & Kerns 1999).

TABLE 1. *The INCODE Barometer.*

Name of student	
In the activities in class, the student:	
INDIVIDUAL	
1	Presents ideas that are suitable for the task
2	Presents creative ideas
3	Presents new ways to implement ideas
4	Evaluates the advantages and disadvantages of actions
5	Identifies relationships among different components of the task
6	Faces the task from different points of view
7	Uses available resources ingeniously
8	Foresees how events will develop
9	Shows enthusiasm
10	Persistently pursues the goals
11	Takes daring yet reasonable risks
12	Orients the task towards the target
INTERPERSONAL	
13	Transmits ideas effectively
14	Listens to teammates
15	Establishes constructive group relationships through dialogue
16	Collaborates actively
17	Contributes to group functioning
18	Takes initiatives
19	Drives others to act
20	Faces conflicts with flexibility to reach agreements
NETWORKING	
21	Applies ethical values
22	Takes into account the implications of the task for society
23	Is able to work in multidisciplinary environments
24	Is able to work in multicultural environments
25	Uses networking contacts to reach goals

Please do not leave any blanks. Not all assessment tasks and situations are conducive to demonstrating all of the capacities and skills to which the items refer; in such cases “0” is the appropriate response.

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Behavioural Observation Training

After a general introduction, the first training element in Behavioural Observation Training (BOT) starts unannounced with a staged conflict situation between the trainers and an external person in order to base the learning process on direct experience. Immersing trainees in an ambiguous situation with no clear task at the beginning gives firsthand experience in the complexities of behavioural interpretations. After the trainees write down their observations, they are asked to compare their individual observations and to discuss possible reasons for differences. Here the focus is on the process of observation, on the detection, perception and recognition of certain relevant aspects of behaviour.

Participants become aware of sources of error that are detrimental for observation accuracy, such as loss of detail because of simplification, categorization and contextual errors, prejudice etc. (Thornton & Zorich 1980). In this training unit trainees should learn to substitute automatic categorization processes for controlled cognitive processes.

Trainees should also experience the rating situation from the different perspectives of rater and ratee and their mutual influences. Participants are therefore given small problem-solving tasks in groups of four. While two trainees work on the task their two partners respectively observe and assess the trainees' problem-solving competence on a scale. Subsequently, the group compares the individual ratings, reflects on the possible reasons for differences and shares experiences of rating and being rated. A second task allows for a change in roles and again to finish with a discussion of what it is like to rate and be rated.

Recognition of relevant aspects of behavior is the focus of the next assignment for the trainees. While watching a short video sequence of three students working on a task, the trainees have to jot down for each of the three students what they observe as relevant behaviour clues to creativity, which is one of the twenty-five items featured in the INCODE Barometer. Participants compare their results with one another and with the results of experts whose ratings serve as benchmarks.

Rater Error Training

The following phase of the training is on the errors most commonly made by raters. The list of those errors includes similarity errors (the rater is more favourable to people who are similar to her/himself), leniency (raters shy away from negative judgements), halo errors (raters generalise from one prominent personal characteristic to other aspects of behaviour), central tendency errors (raters use only the middle range of the scale and avoid extreme judgements), primacy errors (the first impression has a strong influence on all the following assessments) and context or contrast errors in which situational factors have a strong impact on the rating results.

Rater Error Training (RET) begins with a lecture on perception as a process by which humans interpret their sensory impressions in order to give meaning to the environment (Robbins 2005). This is illustrated by visual illusions and pictures with ambivalent content. Subsequently, the most common rater errors are described, the trainees are confronted with the types of errors they made on the tasks before and they are instructed on how to avoid them.

Frame of Reference Training

Frame of Reference Training (FOR) training attempts to provide raters with a frame of reference for making evaluations of the ratee's performance with the objective of reducing arbitrary decisions on performance. Raters discuss their own standards and implicit theories of performance in comparison to normative standards developed by experts. The overall aim is to share a common understanding of performance standards.

In training to use the INCODE Barometer, FOR starts with a description of the indicators and dimensions of the Barometer, focusing on examples of behavior that show innovation competence. Instead of using behaviourally anchored rating scales, which in less complex settings would be an ideal way of specifying performance standards, only a few representative examples for high and low performance on an item are presented.

Raters are trained with video-vignettes that convey performance realistically (Ryan et al. 1995). Three different videos are used, which present examples for good, average and poor performance with an increasing degree of difficulty. Raters receive feedback on the discrepancies between their ratings and the

target scores. Raters will also have a guide with the INCODE Barometer and several examples of alignment with context of use that will help in training and application.

Studies on Frame of Reference Training have shown significant improvements in rating accuracy (Roch et al. 2012; Bernardin & Buckley 1981; Athley & McIntyre 1987). But, as Myford and Wolfe (2009) state, even an extensive training program will not guarantee that all participants understand and agree with the standards. Consequently, INCODE rater training has been conceived to end with a certification exercise in which participants must match the ratings of videos that have been awarded by a panel of experts in order to receive certification. The effects of training regrettably do not last over time (Congdon & McQueen 2000), making re-training or at least periodic re-calibrations, using e-learning modules, for example, recommendable.

CONCLUSION

In conclusion, this article has presented a proposal for the assessment of the behaviour portrayed in students who possess, or aspire to possess, innovation competence, a cluster of competences, capacities and skills that are in increasing demand in the workplace. The set of criteria, the INCODE Barometer, can be used in self, peer and tutor assessment but, due to the complexity of the assessment, should be preceded by training that will familiarize the user with behavioural observation, errors frequently made by raters and the specific framework in which the assessment is to occur.

We trust that the INCODE Barometer and the training procedure for its application will be a major contribution to higher education programmes for the development and assessment of innovation competence. Actual integration of the tool and training into curriculum design remains to be addressed. After integration, despite the fact that initial findings are encouraging, teachers and students may not obtain the expected positive outcomes automatically, which is another matter to be addressed. Future work will have to confront these challenges.

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WORKING LIFE FAMILIARISATION THROUGH HATCHERY ACTIVITIES

Meiju Räsänen & Sami Lyytinen

A significant number of people in the information society work to find, produce, develop, adapt, extend and create information. Individuals are increasingly required to have self-direction and an ability to manage both their intellectual processes and activities directed at information. At the same time, the individual also has to learn from others and create new competences in situations that are by their nature more social, taking place in networks and frequently changing. An individual does not need to know everything, but he or she must be able to exploit other people's skills and ideas. Thus the ability to develop oneself, create and take part in innovation processes become yet more important competition factors in all areas of the society. (Hakkarainen et al. 2004; EK 2011.)

This trend exists equally in the field of education. The education system must be able to serve the needs of a changing society that is becoming more complex. In addition to knowledge-based learning, education must therefore improve other skills and competences. The Finnish education system has traditionally excelled in producing theoretical skills, but this is no longer enough (EK 2011). By supporting versatile development of expertise via innovation pedagogy, the Faculty of Technology, Environment and Business (hereafter TEB) of Turku University of Applied Sciences has a history of encouraging students and teachers to adopt new ways of thinking.

Even though innovation pedagogy is initially more a learning approach with emphasis on creating new ways of thinking instead of a dogmatic view on methodology, teaching at TEB has during the last few years focused strongly on creating and applying new learning methods to promote students' active learning. Now teaching and learning emphasise problem-solving skills, action and co-operation, and the students' own activity and participation play a key

role. One such learning environment at TEB is working in hatcheries, which are included in the curriculum of the students either as compulsory or optional study units. The base of the hatcheries lies deep in social learning theories, which are applied in practice sometimes in very similar ways to hatcheries in other universities (please cf. Houweling & Zijlstra in this volume).

Research, development and innovation activities that are attached to a working life context are one of the cornerstones of innovation pedagogy. This is also reflected in different hatchery activities. The hatcheries at TEB introduce the students to interaction, co-operation and mutual development work with working life outside the university through different methods. The goal is to bring mutual benefits to both the outside actor, the university and, first of all, the students of the university.

PROJECT HATCHERY

The Faculty of Technology, Environment and Business has included a project hatchery study unit in its study plan since 2008. The main idea behind the project hatchery is to have all students of the faculty working on designated project assignments in multidisciplinary groups already during their first term. The idea is to familiarise the students from the early beginning of their studies with learning situations in multidisciplinary groups, and often outside the subject area of their own degree programme. Assignments are provided via external commissions from clients outside the university. The work in project hatcheries aims to produce new visions and thoughts or, at its best, even new product and service ideas (see Lyytinen 2009 and Lyytinen 2011).

The goal of the project hatchery is to instil into the students skills that are needed in an education aiming at subject specific know-how as well as skills that are needed in work life and producing new innovations. The goal was described in 2008 by Liisa Kairisto-Mertanen, Dean of the Faculty and creator of the project hatchery:

The goal was to introduce more communality to the work at the faculty and create a situation where students from different degree programmes know and trust each other and appreciate each other as different future professionals studying different things. We also wanted to familiarise the students at the very

start of their studies with project-based learning and independent working as well as coping with uncertainty. Other goals included presentation skills and working in teams. Learning the actual topic was a secondary goal, but each group was still expected to increase its knowledge by working with an interesting project. However, most of these goals largely belong to soft skills. They have also become an essential part of any occupation taught at the university.

The learning objectives of the project hatchery are largely related to communal and networking skills. The importance of these skills and their inclusion in teaching have, particularly in recent times, have been emphasised by employers. Among others, the Oivallus (“Insight”) report published by the Confederation of Finnish Industries considers them as an important element in creating innovations and managing future job profiles more extensively (EK 2011).

At the practical level, the project hatchery is implemented in its current form so that first-year students are mixed in multidisciplinary groups with students from each degree programme of the faculty. Group size is some 10–15 students, and each group has a more experienced student tutor who has previously completed the relevant study unit and who supervises the implementation of the project assigned to the group. The teachers of the project hatcheries have three groups each. The role of the teacher is, on one hand, to act as a responsible leader and, on the other, as an initiator, supervisor as well as factual and methodical mentor for the work. Responsibility for the work in each group lies with the student tutor and the project manager or coordinator selected by the group among its members.

This project hatchery has been designed to last through the autumn term of the first year. Joint meeting times have been set aside in the timetables of all degree programmes, three hours each week, which ensures that suitable times are available for all groups. However, the actual project work typically takes place mainly according to the group’s own organisation outside these times.

The project hatchery study unit includes an implementation plan that is independent of the client and relates to project working (such as drafting a project plan and the final report or producing posters and presentations explaining the work) as well as fixed dates to roster pedagogical targets. The project hatchery groups will use their posters and presentations to participate in a competition where the teaching staff will select and reward the best groups.

The student-specific assessments of the module are carried out by the teachers of each group. Turku University of Applied Sciences has published a guide on the structure and practices of the project hatchery that provides more insight into the details relating to the study unit (see Niittymäki & Seppälä-Kavén 2012).

The topics of the project hatcheries have been drawn up from an extensive number of assignments with clients from private companies as well as public bodies to EU-funded initiatives and regional development actors. The project hatcheries have tackled such challenges as the development of a client's services, arranging an event for the students' own faculty, regional development from the level of a housing cooperative to planning the future of a town district, independent implementation of a part of an EU-funded project, and many others. No assignment will be excluded from project hatchery activities from the outset.

RESEARCH HATCHERY

Unlike project hatchery, the research hatchery is not an independent study unit. Rather, research hatchery is one of the teaching methods of innovation pedagogy that enables combining research and development work as well as the university's service activities into studying and learning. The method has been developed since 2004. The difference from typical project work is its approach emphasises research points of view – irrespective of the fact that a research hatchery carries out, as such, normal project or service activities. Lehtonen et al. (2006) give the following definition in the first-ever publication on research hatchery:

Research hatchery is a learning and research environment where it is possible to carry out studies under counselling and produce new information for use in research and development work. In research hatcheries, students work on their own subprojects. The students report the progress of their own work in regular meetings and receive advice and guidance on managing the research assignment.

The actors of a research hatchery consist of a tutoring teacher or project manager of the RDI project and senior students or project workers previously involved with the project who guide small student groups. The students work

in small groups of 3–5 people, where each student has an allocated duty. The students record their working hours, which will count toward credits. Student learning takes place in various ways: as independent learning, through advice and guidance, with peer support as well as by observing the senior researchers' and students' work (see Räsänen & Kyllönen 2013). It is essential that individuals can reach better results and learning objectives together than by working alone.

From the perspective of working life, the research hatchery has a significant role. Working life connections acquired through authentic projects promote not only networking but also the students' foundation and development in professional expertise. Similarly, the research hatchery provides teachers and other personnel with an opportunity for professional development and expanding their networks. The work methods of the research hatchery also liken working life practices, whereby the hatchery creates an ideal and safe environment to practise these skills (see Räsänen & Kyllönen 2013). Good examples of this include project management skills and taking responsibility. On the other hand, as a learning environment the research hatchery even makes it possible to convey information and skills that cannot be absorbed theoretically from books. These include for instance shared expertise and tacit knowledge.

From the perspective of societal pressures towards Universities of Applied Sciences, research hatchery is an ideal applied model on how to integrate all duties of the university with each other – teaching, research as well as support to working life and the economic structure within the university's own region. In the future, research hatcheries should be used more systematically, both among teachers and students. This perspective must be observed already at the planning stage of projects. Hatchery working should have its own “market place” where demand and supply meet. Emphasising the multidisciplinary aspect in research hatchery work should also be brought to the centre stage. These development needs are currently being worked through in an internal development project at TEB. Similarly to the project hatchery, Turku University of Applied Sciences has published a guide on the structure and practices of the research hatchery that provides more insight into the details relating to the study unit and its implementation (see Räsänen & Kyllönen 2013).

EXPERT HATCHERY

Another teaching and learning method that enables sharing tacit knowledge is the expert hatchery. This method can be used to implement almost any study unit in its entirety, but it can also be used as part of a study unit. Expert hatchery utilises the know-how of experts from different fields as well as their experiences in working life and different projects. In addition to valuable information, students have the opportunity to study how experts intuitively discern their own work and occupational sector. Acquiring this kind of practical knowledge at the beginning of the studies and linking knowledge with theoretical competence is important in terms of the development of students' expertise. Expert hatchery also supports the creation of working life contacts as a teaching method and facilitates networking. (See Hyypä 2009.)

Students are divided into small groups of 2–3 people in an expert hatchery. The students select their own subject among previously presented themes and plan an interview relating to the subject. Creating the interview questions requires that the student gains a deep insight of the subject area. The questions are submitted to an expert for review in advance. The interview itself should be very interactive. Even though the interviewers must follow a list of questions compiled in advance, they also need to take into account any additional or complementary questions during the interview. The interview requires situational sensitivity, particularly from the interviewing small group, although the activity and enthusiasm of the entire student group will impact the success of the situation. The teacher will also need to encourage the students to create an interactive atmosphere and ask questions. After the interviews, the teacher will hold a debrief meeting and the small groups will compile summaries of the expert interviews. (See Hyypä 2009.)

The significance of the interview method to teaching is obvious. It is an efficient and cost-effective means to bring current working life knowledge to the students and offer them an opportunity to apply previously learnt knowledge and skills in a new way. Recording and documenting the interviews also makes it possible to collect valuable information for other teaching uses. They are also ideal study material for examinations, bringing variety to lecture notes and literature. (See Hyypä 2009.)

Expert hatcheries should also be developed further in the future. This teaching and learning method could be used for, for example, introducing a new innovation process and familiarising the students with it. Supporting properties required to create innovations (such as imagination and collective learning) is also possible with this method. The individual might have ideas based on the thoughts of other audience participants in the discussions that would not be possible otherwise.

FINAL THOUGHTS

New competences cannot be created unless we are prepared to let go of traditional conceptions and attitudes, and unlearn established or outdated practices. Approaches like the hatchery activities at TEB provide the students with valuable food for thought and learning environments for future work. Multidisciplinarianism, collective working, encouragement for unbiased dealing with issues and, most of all, focusing on working life communities and RDI work in hatchery activities make it possible for innovations to become a natural part of students' everyday life and an important part of their studies, alongside with the more traditional theoretical learning.

Individual study units are not enough, however, and we need a new kind of learning culture that cuts through the whole degree. Students should become accustomed to challenging and innovative learning environments on their study path. One of the ways to realise this would be to allow the students to complete all their study units as hatchery courses. This would support the students to adopt an open, research-oriented and innovative way of thinking throughout their studies.

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THE PUZZLES AND PEARLS OF SITUATED LEARNING

Starting out your professional career by
participating in a Community of Practice

Loes Houweling & Nienke Zijlstra

INTRODUCTION

From the perspective of social learning theories, situated learning, by which we mean learning in the context in which the information learned is applied, has promising connotations. Hands on learning within a business situation, learning from and interacting with the participants in that situation, steered by questions of importance, has been adopted by several universities of applied sciences as a method for supplementing the didactics of conceptual learning and internships. For instance, Turku University of Applied Sciences employs innovation pedagogy in which students participate in project hatcheries (see Räsänen & Lyytinen in this volume). Basically, this approach refers to enhancing the innovation competences of students.

At the Faculty Society and Law (FSL) of Utrecht University of Applied Sciences the term *Community of Practice* (CoP) is en vogue. These CoPs start from comparable didactical principles with project hatcheries. According to the literature on processes of knowledge creation in a CoP, participation in such a community offers opportunities to learn on different levels: social, content, practice. Both CoPs and the hatcheries focus on the production of *contextualised* knowledge more than on *generalised* knowledge (Gibbons et al. 1994, referring to the first as mode 2 knowledge, and to the second as mode 1 knowledge). Both value the development of competences for collaboration and innovation, and offer opportunities to combine education, research and innovation.

The core focus of our training at FSL is to educate conscientious, confident and innovative social professionals, with the aim of ensuring they are ready to start their professional life, able to add value to the professional community and able to keep on learning through practice. We wanted to know how participating in a CoP adds to the development of a young professional and what problems the students come across. Our study is executed in the field of social innovation, which differs from the areas of product innovation. However, on the issue of learning processes our research raises questions that are of interest to that area as well.

Two students from our department interviewed 15 students participating in three CoPs. The authors also interviewed the teachers who facilitated the CoPs. With the results of these two components of the research project, a group interview with the facilitating teachers was executed. In this article, we concentrate on the learning outcomes for students and do not focus on the information about the role of the facilitating teachers, which was also subject of research.

After an explanation about what led to our hypothesis that working with CoPs could expand our pedagogical and didactical approaches, we highlight some of the results of our qualitative study. The article ends with a presentation of important issues that merit further discussion in our department, and probably in other institutes as well.

LEARNING AND COMMUNITIES OF PRACTICE

Within the professional field for which the Faculty of Society and Law educates professionals, some major changes are going on. As a result of these changes, the field demands professionals, who are able to collaborate with other professionals, but above all, able to collaborate with the clients. In addition to this, Utrecht University of Applied Sciences has also observed that students are changing as well. Students would like to have more influence in their studies: in tempo, didactics and content. The faculty developed the idea that working with CoPs might offer opportunities for all these questions.

The term *Community of Practice* refers directly to the ideas of Etienne Wenger (1998). The main point of Wenger's CoPs is that people learn through participation. He sees learning as a social process which occurs through the interaction of people motivated to improve their performance. This type of social learning has several aspects: learning by experiencing, learning by doing, learning by belonging and learning by identity. Wenger developed his ideas in and for organisational learning and not primarily for initial educational purposes. This justifies the question: to what extent and how is working in CoPs a useful addition to the didactical options of our educational institute?

According to Wenger, CoP is a fuzzy concept. CoPs come into being instead of being organised. Therefore it is hard to point out the exact purposes and the boundary of communities. The stakeholders of this research project discussed extensively the exact definition of a CoP and the identification of existing communities in our department as CoPs in relation to their many potential purposes: learning outcomes, knowledge development, (social) innovation or research. We composed a working definition: *a group of people, students from different professional trainings, fieldworkers, researchers and teachers, who, depending on the goal of the community, are collaborating and co-learning by resolving a problem in professional practice.*

As a research context, we randomly chose three appearances of communities. In Table 1, we describe the communities with the help of the three dimensions Wenger distinguishes (Coenders 2012): *Practice* (the shared practice), *Domain* (relevant themes within the practice) and *Community* (the network of people).

TABLE 1. *Description of the CoPs.*

CoP/Dimension	Practice	Domain	Community
Financial Health of Young People (FHoYP)	Based in a school for secondary vocational education in Utrecht. The community tries out interventions and conducts research into increasing the financial health of young people.	Financial health of young people.	15 students, 5 fieldworkers and the CoP facilitator (researcher and teacher). Connections with a broader knowledge platform for the Financial Health of Young People. This platform meets once every 6 weeks to learn from each other and discuss current developments.
Wrap Around Care (WAC)	The community learns how to improve the health coordination in the city of Nieuwegein by applying the concept of Wrap Around Care.	Wrap Around Care, an innovative concept in the coordination of youth care.	15 professional fieldworkers, 5 students and 2 teachers (one of them is also CoP facilitator). The community is led by a teacher, a student and a fieldworker. Also this community has connections with the broader knowledge platform of Wrap Around Care.

Kanaleneiland (Region of Utrecht) (KAN)	Project hatchery to improve the living conditions in a region of Utrecht City. The goal of this project is to establish several projects with professional fieldworkers and provide students with the opportunity to earn points of excellence.	Improve social cohesion and living conditions in the district.	The heart of the community is formed by 5 students and a teacher (CoP facilitator). 25 other students participated during the project; several other projects with organisations in the field have taken place.
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In addition to the differences in organisation and objectives, the starting positions of the communities are also different. Community FHoYP has existed for several years and is created out of the network of the knowledge platform on financial support from the faculty. Community WAC started in October 2012 as a result of an issue raised by the city Nieuwegein in meetings with the knowledge platform Wrap Around Care. Community KAN was initiated by the faculty in September 2012 with a double focus: to improve excellence among students and to improve the living conditions in a region of Utrecht City.

STUDENTS ON THEIR LEARNING

The research shows that the experiences of students differ from one CoP to another. The different ways of organisation, the age of the CoP and the domain all influence the experiences of the students. Therefore we discuss the experiences of the students in the three communities separately. In Table 2, we highlight the opinions of the students, divided over the three dimensions of Wenger.

TABLE 2. *Opinion of the students.*

CoP/ Dimension	Practice	Domain	Community
Financial Health of Young People (FHoYP)	The students running the consulting office for pupils from the school for secondary vocational education seem to share different practices than other students involved in the organising activities.	Students report that they learned a lot about the domain of the CoP.	They hardly report on collaborations with other professionals. There are hardly any remarks about learning as a collaborative and social activity. The role of students often resembles that of an internship.
Wrap Around Care (WAC)	Hardly any remarks on joint practice. Practice of students differs from practice of professionals.	Most remarks are on the domain of the CoP, which incorporates professionals working together and <i>what that really looks like</i> ¹ . Another observation from a student is: <i>you increasingly learn about what people's power really is and how clients can take control their own directions</i> . ² Striking is the comment of one student: <i>you learn a lot about Wrap Around Care, but theoretically speaking, you could have done that at home.</i>	The students in this community seem to feel on the outskirts of the community of professionals.

1 The original Dutch quotes are translated by the authors.

2 The student talks about the main goals of the new legislation in the social domain: clients having more say in which direction help is given and professionals are focusing on the powers within the client or the client's social network.

CoP/Dimension	Practice	Domain	Community
Kanaleneiland (Region of Utrecht) (KAN)	Seem to share one practice.	They talk about the way they want to organise the CoP, for instance in discussions about the benefits of having a chairman or not. They report having learned to dare to take actions. Some students talk about learning about the issues in the Utrecht area.	Students experience this CoP as one in which they all have equal roles. They feel much attached to the community. They frequently report having learned from the collaboration with students from other professional backgrounds. For instance: <i>You look at things from your own perspective, but you learn that there are other perspectives as well.</i> Another student said: <i>You learn to look at questions not from one viewpoint, but from different viewpoints. That has a good outcome.</i> Most remarks are about developing competences for collaboration, the forming of a community as a network of people.

The students are asked about the problems and benefits of working in a CoP. They see all kinds of opportunities to learn, but sometimes experience the way of learning as too time-consuming. Students also report problems in the adjustment between the demands of their training and their learning experiences in the CoP. In the discussion section, we will look at these issues in further detail.

COP FACILITATORS'/TEACHERS' PERSPECTIVES ON STUDENTS' LEARNING

Although we asked the teachers facilitating the CoPs about their experiences and the way they perform the role, in this article we concentrate on their reports regarding the learning experiences of the students. It is noteworthy that both in CoP WAC and CoP FHoYP, there is a difference between the experiences of the students and of the facilitator. In the group discussion with the CoP leaders they framed this as students not yet being able to overlook the implications of what is happening in the CoP: *They start with the idea of learning content, but discover the continuous effort that they have to make to organise the preconditions.* Another remark about the differences in expectations of students and opportunities for learning in a CoP is: *I think students get an insight, yes, they can then start to question things themselves, such as, why is this happening, what is happening and what ought to happen.* All CoP facilitators report the learning processes of learning competences within a community context, while the students of these communities are not always aware of this, as Table 2 shows.

In FHoYP and WAC more than in KAN, students reported that they learnt about the domain. The domain for CoP KAN is perhaps a little too fuzzy. One CoP leader expressed that students were not aware of the fact that they are in the middle of the topicality of the changes in the work field and the inflexibility of these kinds of changes. *They do not realise how cool that is,* she says.

CoP facilitators fulfil all kinds of roles with regard to the students and the training. With reference to guiding the learning process, one facilitator points at the efforts she makes to help students to take their time to reflect. Students, as all three agree on, are often too focused on the required outcomes of their assignments to see what is happening. Students evaluate their learning outcomes within the official demands of their training: *They learn what they have to.* The CoP facilitators are positive about students learning about their professional identity especially when working with different professionals.

DISCUSSION

Reflecting on the experiences of students and CoP facilitators, we see three main issues related to learning outcomes for students. First, the degree of involvement in the community defines the perception of the learning outcomes. For instance in CoP KAN, students have a high level of responsibility for the achievement of the community compared to the students in the other CoPs. Their involvement in the communities influences their way of learning. They report on the development of competences for innovation and collaboration more than the students in the other CoPs. These students often talk about learning from students with another background. This is an important aspect of Wenger's theory. Belonging and equal membership are significant conditions for valuable social learning processes (Wenger 1998). Experiencing involvement and responsibility seems to question the traditional educational setting with the common relationship between student and teacher (apprenticeship). Such a relationship is hard to transform into a more peer-to-peer approach as the KAN community reported. This more equal relationship seems related to feelings of involvement and responsibility. A shift in the pedagogical view amongst teachers and students is therefore required. Also the relationship between students and professionals could be taken into account. As a consequence of their open and fresh minds, students can be very helpful when it comes to questioning common sense, which might lead to innovations. Students need to be taken seriously, both for the learning process of the students as well as for the yield of the CoPs.

Secondly, the focus of students and their traditional training is on what Engeström (Akkerman, 2012) calls *vertical learning*: knowledge about the professional domain. In order to succeed in their training, students have to develop knowledge and skills of their professional discipline (Wenger's Domain dimension). Therefore they do not apply what they learn from the process of participating, i.e. taking responsibility, collaboration, organising preconditions, and developing new and fresh insights. Engeström refers to this as *horizontal learning*: learning to cross boundaries and cooperate with separate domains. Here we see a strange contradiction. CoP facilitators point at these important learning outcomes in the light of the changes within the professional field. Students report having problems with the incongruities between the assignments of the training and their learning experiences in

the CoPs. Although training claims to pay attention to these competences, these are not visible in the assignments. Students can likely yield more of their CoP participation when the assignment of their training is more focused on horizontal learning than is currently the case at the moment.

This brings us to the third issue of perceiving and evaluating learning outcomes. Although most students in this research are near graduation, the facilitators report that they needed to be helped to reflect on their experiences. Learning by doing and experience takes time. Learning processes in a community are situated and non-predictable, so are learning outcomes. This means that to see the valuable outcomes, both collective and individual, reflection is required. Reflection with and by students and the rest of the community members is necessary to discover and make explicit the richness of learning by doing, experiencing and participating in a community of practice. Although all curricula claim to focus on reflection and developing skills for lifelong learning, our research shows that the way this is done needs further consideration. With or without extending the possibility to learn through participating in a CoP, these skills are necessary for lifelong learning and on-going innovation.

In short: participation in CoPs indeed seems a promising extension of the didactic possibilities. Participation in CoPs can be an opportunity for students to develop innovative and collaboration skills. In our research, it is often reported that the students focus on 'getting the training assignment done'. To yield more from participation in CoPs, we need to be more explicit about what social innovation and collaboration means and which competences (e.g. judging information, collaborating with different professionals, creating, designing) students need to develop. Training programmes need to reconsider the way in which students are asked to reflect, the relationship between vertical and horizontal learning and the teacher-student relations. In other words, we need to come to shared didactics of innovation. As a result of our recommendations based on our research project, we advised the FSL to enable a discussion within the training with a view to developing (social) innovation skills and participation in CoPs. Another issue is how to organise this type of learning. We would be interested to learn from the hatcheries and suggest a benchmark study, which focuses on the organisation of the hatcheries, especially on the way these are embedded in the curricula and the criteria for graduation.

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NOISY KNOWLEDGE AS A PEDAGOGICAL CHALLENGE

Taru Penttilä & Ari Putkonen

INTRODUCTION

A continuous interaction, in which breaking borders between different fields of knowledge and organisations is encouraged, and which encompasses all the actors involved, is a prerequisite for success nowadays. This is the challenge that innovation pedagogy aims to tackle. A boundary crossing approach (for instance in problem-solving, service or product design, research or organisational teamwork) enhances creativity, and new innovations are more likely to occur. In innovation pedagogy, the social aspects of working and learning are emphasised and group processes where learning happens in multidisciplinary teams form an essential part of the whole process of learning.¹

We believe that innovative solutions are created through social learning in diverse surroundings. For instance Leonard-Barton (1995) states that knowledge is at the heart of innovation and that innovations typically emerge at the boundaries of different knowledge domains. In the article, we introduce the new concept of *noisy knowledge*, compared to *tacit knowledge*, to describe the contributions of social learning environments and boundary crossing in innovation creation. The focus of this article is to describe the knowledge concepts behind the innovation pedagogy approach and link them with the fundamental stages of the innovation process. The aim is to show that various types of knowledge as well as the concept of noisy knowledge are needed to explain the typical course of innovation processes today.

¹ Penttilä & Kairisto-Mertanen discuss boundary crossing in more detail in their article in this publication.

THE CONCEPTS OF KNOWLEDGE AND COMPETENCE

One of the challenges posed for the universities of applied sciences is how to educate professional experts who have both practical know-how and theoretical knowledge. However, the distinction between the concepts of knowledge and know-how is not unambiguous and needs to be discussed separately, especially if knowledge is to be managed as a strategic asset. Garud (1997) reminds that although the term *know-how* has been widely used to represent knowledge, it is but one component of the intellectual capital, and there are at least two other components of knowledge.

Lundvall and Johnson (1994) state that there are different kinds of knowledge which are important in the knowledge-based economy: *know-what*, *know-why*, *know-how* and *know-who*. *Know-what* refers to knowledge about “facts”. Here, knowledge is close to what is normally called information. *Know-why* refers to scientific knowledge of the principles and laws of nature. *Know-how* refers to skills or the capability to do something. *Know-who* becomes increasingly important and is tightly related to networking of people. It involves information about who knows what and who knows how to do what. In addition, it involves the formation of special social relationships that make it possible to get access to experts and use their knowledge efficiently. (Lundvall & Johnson 1994)

The concepts of *competence* and *qualification* are often linked with the concept of knowledge. They have both been discussed widely in the literature, but there are still several different definitions for them. Ruohotie (2003) refers to Ellström (2001) and offers five meanings for the concept of *competence*. Competence can be defined as formal competence while it is based on the individual’s education and its degree requirements, and on the person’s eligibility for further studies. Formal competence can be defined as well by qualification requirements set by the labour market or trade unions. Another viewpoint to competence is to describe it as individual capacity, the individual’s real potential competence. A common approach to competence is also to define it with the requirements needed in the successful performance set by the workplace. The fifth definition is such occupational competence which an individual can utilise and develop in his work.

Profession-specific knowledge soon becomes obsolete in the changing working life, and thus the concept of *qualification* often refers to the worker's ability to manage the changing responsibilities at the workplace (Hövels 2001). The extent of the concept has expanded from professional and technical-instrumental knowledge and skills to new knowledge and skills that help workers to meet changes and react to them in their working environment. These new requirements are often called key qualifications (Ruohotie 2008).

Raij (2003) discusses the concepts of knowledge and competence in the universities of applied sciences, and presents how they can surpass the bisection between scientific and professional tradition. Four components together form an integrated whole which enables competence and expertise. Competence of students at the universities of applied sciences consists of combination of these four elements, which are 1) scientific knowledge, 2) professional skilfulness / practical know-how, 3) understanding of the context and its phenomena 4) and mastery of various situations. Also Nurminen (2003) has a similar approach to the concept of knowledge. According to him, knowledge is created by the ability to combine together the various fields of competence: knowledge, skills, experiences, value implications and social networks.

Degree programmes at the universities of applied sciences in Finland have defined generic and degree programme specific competences. Degree programme specific competences form the basis for the development of the students' professional expertise. Generic competences are areas common to all degree programmes and form the basis for operating in the working life, collaboration and the development of expertise, and they are based on EQF definitions (European Qualifications Framework 2008).

Finally, Gibbons et al. (1994) and Nowotny et al. (2001 & 2003) distinguish two different modes of producing knowledge. They make a distinction between academic scientific knowledge and the knowledge born in situations originating from the need to solve practical and application problems. The concepts of expert knowledge, know-how, tacit knowledge and intuition are important in contexts relating to a concrete innovation process, as we demonstrate later in this article.

KNOWLEDGE AND LEARNING IN INNOVATION PROCESS

One of the most referred theories of organisational knowledge creation is developed by Nonaka and Takeuchi (1995). They stress that the role of the organisation in knowledge creation is to develop the conditions that would enable knowledge creation at the individual, group, organisational or inter-organisational levels. They state that the knowledge-creating process of an organisation occurs through the conversion and interaction between its tacit and explicit knowledge. This is a social process between individuals and it consists of four modes where the type of knowledge transforms: socialisation (from tacit to tacit), externalisation (from tacit to explicit), combination (from explicit to explicit) and internalisation (from explicit to tacit). Because of these four modes of knowledge conversion, it is also called SECI model.

Products and services are more and more complex, and their use environments are increasingly mobile and virtual. The innovation process can be seen as a knowledge transformation process from an idea to a (technical) system, and the system is then formed within the limits of the designers' (all peoples involved) cognitive and information capacities (Nevala 2005). The problem is always unique and specific, and thus design knowledge must be translated to support the specific case.

In the innovation process knowledge is used for creating new artefacts or improving existing ones. This process is the focus of design science that aims to develop knowledge for the design (process) and for realisation (implementing an innovation), and also for the utility evaluation of the artefact (van Aken 2004). A technology-based artefact is a typical example of the application of design knowledge, but organisational design activities, such as work practices and policies, are also regarded as design science activities (Hevner et al. 2004).

The first paradigm of the innovation process was *technology centred*, the second wave was *user-centred*, and the present can be named *systems centred*. The paradigm shift means that the design team needs a holistic view about the problem and the solution space. The sources of these requirements can be for example users, delivery chains, manufacturing technologies or authorities. Besides the technological needs, the environmental dynamic factors, users' psychosocial needs and the functional purposes of organisations are important sources of knowledge for the desirable products. The more deeply designers understand the users and the use context of a product or a service, the more

they are able to discover the psychosocial needs of the customers. This way they fulfil the explicit technical requirements, but most importantly the tacit requirements of users caused by dynamic changes in the external environment. This systems approach supports new innovations, because knowledge is not tightly linked to product functions or features, and gives a broad pre-understanding about the problem backgrounds and alternative solutions. (Putkonen 2010)

According to Järvinen (2004), the systems development consists of the following stages: (1) construct a conceptual framework, (2) develop system architecture, (3) analyse and design the system, (4) build the system and (5) observe and evaluate the system. Each stage is designed to gather information and perform all the tasks necessary to progress in the design project. Between the stages there are entry gates or decision points where the results of the actions of the previous stages are reviewed and the quality is checked. This systems development depicts well the main stages of typical product or service development as well, where explicit and tacit knowledge are utilised and created interactively. Table 1 describes how the different types of knowledge are created, used and assimilated during the innovation process and in which innovation pedagogy considers this process from the learning perspective.

It is argued that explicit and tacit cannot be separated, if we talk about knowledge and meanings, because they are interdependently linked (Cook & Brown 1999). As emerging in the interplay of various perspectives, innovation is faced by a conflict of beliefs and intentions.

The paradox lies in that each belief or intention can be justified in one community but not readily accepted in the other. Linked to different beliefs and intentions are the identities and the status of the different stakeholders – that also are negotiated in the ongoing interaction. We see this as a central dilemma of innovation, because in these conflicts we find the potential for an innovation, but often also the main source of failure. (Sproedt & Larsen 2012)

TABLE 1. *Descriptions of knowledge created, used and assimilated during the innovation process.*

Stage of innovation process	Knowledge creation mode (Nonaka & Takeuchi 1995)	Types of knowledge in use	Objects of learning and knowledge assimilation
Construct a conceptual framework	Socialisation	Tacit knowledge, intuition, information, know-why	Meanings, concepts, metaphors or hypotheses
Develop a system architecture	Externalisation	Explicit knowledge, know-what, understanding principles	Common understanding of a problem and its potential solutions
Analyse and design the system	Externalisation	Tacit and explicit knowledge, expert knowledge, categorising knowledge	Design information in the form of plans, drawings, calculations, diagrams, models or prototypes
Build the system	Combination	Explicit knowledge, practical knowledge, process knowledge, know-how, know-who, networking knowledge	Realisation of design, sharing of practical experiences, social context and team collaboration
Observe and evaluate the system	Internalisation	Explicit and tacit knowledge, contextual and situational knowledge, know-how, expert knowledge	Observations, findings, conclusions, new mental models and thoughts

The everyday practice of innovation can be understood only in the light of the processes of relating between the involved; what we know and how we know is essential for what is legitimate or not in the social practice of innovation. One of the basic assumptions regarding innovation pedagogy is that all the knowledge created, used and assimilated in learning environments expands the traditional way of understanding the valuable knowledge available. In order to merge knowledge creation, learning and innovation processes, we have thus launched the new concept of *noisy knowledge*; which covers multidisciplinary activities *in the social learning environment where the knowledge is discussed, shared and accumulated creating synergy, e.g. even new ideas and innovations.*

In an innovation process, different types of knowledge are needed and used. When boundary crossing in a social learning environment is included to this process, through noisy knowledge in interaction, the ability for creating innovations is improved. When learning is understood as a learner's conscious knowledge formation process that takes place in a certain cultural and social context (Tynjälä 2002), knowledge can be considered as an object having certain characteristics that enable it to be utilised in building internal cognitive models. These models are, in fact, born as a consequence of learning. In a learning organisation people should continually discover how they create their reality and how they can change it (Senge 1992).

Thus, innovation processes do not always call for formal systems and processes, as transmission, processing and renewal of knowledge can be efficient also without them (e.g. Hutchinson & Quintas 2008). When there is space for innovation and freedom to explore new ideas, people can express themselves freely. They can share ideas, encourage each other, get inspired and even talk simultaneously when creating and sharing ideas – then the emerging knowledge can be noisy, literally.

CONCLUSIONS

The aim of the article was to present the types of knowledge in the context of the innovation process based on the background of the innovation pedagogy approach. Innovation pedagogy strives for contextually emerging and cumulative knowledge, which is also boundary-breaking, practical, sustainable and societally durable by nature. Thus the question regarding the type of knowledge behind innovations becomes essential.

We discussed how knowledge is assimilated and produced in a manner that can create innovations, and explored this in a broader framework from the perspective of current approaches to knowledge creation in the context of innovations. We believe that innovative solutions are created through social learning in diverse surroundings and emphasise the nature of boundary crossing in higher education and its ability to provide the different types of knowledge needed in innovation creation. We discussed a new concept of *noisy knowledge*, which covers multidisciplinary activities in a learning and innovation context. The term is needed to explain the typical course of present innovation processes, where a social learning environment and boundary crossing in knowledge creation are prerequisites.

Thus, to make noisy knowledge possible and to establish a successful social learning environment, we emphasise the significance of space for innovation. This concerns freedom to explore new ideas and make mistakes and time for reflection. The requirements for this kind of learning environment include opportunities to collaborate in a flexible way across boundaries and an atmosphere where it feels psychologically safe and acceptable to take risks and share the experiences, also the mistakes, and learn from them. Students should be trained to be ready to get transformed in order to see things getting transformed. Therefore knowledge management in an organisation should encourage innovativeness by creating learning environments that create an atmosphere enhancing learning and supporting learning processes on individual, interpersonal and networking levels (e.g. Stähle & Grönroos 2000).

As Nonaka and Takeuchi (1995) state, the knowledge-creating process of an organisation occurring through the conversion and interaction between its tacit and explicit knowledge. As this is a social process between individuals, we emphasise noisy knowledge having a crucial role when new innovations are targeted by crossing boundaries. At each stage of the innovation process, noisy knowledge interfaces with different types of knowledge that are used. The findings of this article demonstrate the links between the knowledge-creating process by Nonaka and Takeuchi, and how that knowledge is created and used during the stages of an innovation process and assimilated from the learning perspective.

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PEDAGOGICAL VIEWS ON ENTREPRENEURSHIP

ENTREPRENEURSHIP EDUCATION – AN INNOVATION SYSTEMS APPROACH

Hein Roelfsema

INTRODUCTION

Over the years entrepreneurship has become one of the most popular topics in business studies and also a central theme in the large majority of business school curricula. The primary reason is that most senior position jobs in the knowledge economy require innovation capabilities. Whereas traditional management studies have focused on making the most of resources currently under control of the firm, entrepreneurship programmes stress the importance of making a structure that allows making most of the opportunities that arise today and in the future. An important influence on business education is also the influence of alumni programmes, which consistently show that although most graduates may not start as entrepreneurs, they are increasingly likely to end up as one in a later stage of their career. A last explanation for the increasing popularity of entrepreneurship education is that a substantial number of students are convinced that start-up entrepreneurship is the fastest and possibly the only route of becoming CEO of a successful company.¹

¹ For example, research among Harvard alumni shows that no less than 50 percent of them become entrepreneurs within 15 years after graduation, see <http://www.hbs.edu/entrepreneurship/>. In addition, the rising trend in startup entrepreneurship after graduation can be inferred from a record breaking 16 percent of Stanford Business School students who started their own company after graduation, see <http://management.fortune.cnn.com/2012/06/01/mba-startups-stanford/>. More and more business school students opt for internships in startup companies, see for example Wharton <http://www.businessweek.com/articles/2013-06-25/more-wharton-mbas-are-opting-for-startups/>.

Outside business school, for example in science universities, entrepreneurship also has become an important elective subject. A major reason for the endorsement of entrepreneurship in academic curricula is that universities have accepted that the large majority of students will not be employed in science. In this way, in science curricula, entrepreneurship courses thus function as a proxy for a fully-fledged business studies programme. An additional reason is the recognition that valorization of knowledge is equally important as producing it. Lastly, the Internet economy has created new role models for science students, who increasingly see ambitious technology entrepreneurship as a viable career option.

However, many higher education institutions struggle with the effective inclusion of entrepreneurship in the curriculum, and entrepreneurship programmes have to overcome many prejudices among university staff. First, in contrast to overwhelming evidence of the contrary, there is a common belief that entrepreneurship is a born gift and cannot be learned. This type of God-given competence reasoning has a long history in business studies. Before the popularising work of Peter Drucker, it was taken for granted that management was an art and not a skill that could be taught. Also, for long the field of leadership has received the same treatment before being adopted as a major subject of academic interest. So, entrepreneurship is simply the new kid on the block. The analogy with sports comes to mind – many of us want to be able to hit a ball over the net, although we all realise that becoming Roger Federer takes a bit more than practice.²

A second prejudice is that non-entrepreneurs cannot teach entrepreneurship. As most academic staff in higher education institutes clearly are not entrepreneurs – and in general rather non-entrepreneurial – this would imply a major resource constraint in teaching entrepreneurship. In practice, this restriction is non-binding. For the staff of most business schools, the large majority of lecturers have at least some affinity with and sympathy for entrepreneurship, enough at least to act as mentors, guides and coaches for students that aspire to be entrepreneurial. If they, in addition, bring in real life entrepreneurs and actively involve the business community in teaching entrepreneurship, this often goes a long way in serving the needs of students. In science and

2 See Drucker (1985) for the classic treatment on entrepreneurship as a science and how it can be studied systematically. Baumol (2010) is the classic reference for the inclusion of entrepreneurship within the discipline of Economics.

technology programmes, entrepreneurship students are mostly in need of basic business knowledge that can be provided by the business school staff together with guest lectures of technology entrepreneurs, and possibly staff from the university's incubator and technology transfer office.

For universities that are implementing entrepreneurship programmes, there are three challenges, to which we turn next. To start, the curriculum has to balance providing rigorous background knowledge with learning from experiencing entrepreneurship itself. A second challenge is to move beyond individual courses to build an infrastructure within the university that allows student to develop entrepreneurial skills and become real-life entrepreneurs. And third, possibly the most important task is to build the interface between the university and the business community that allows students to make the jump towards ambitious entrepreneurship.

CONTENT AND PROCESS IN ENTREPRENEURSHIP EDUCATION

A central issue in entrepreneurship education is to what extent the curriculum relies on theory when contrasted to experimental learning. On the one hand, successful entrepreneurship requires knowledge of things like accounting, marketing and operations management. To teach these topics effectively, classroom techniques and 'sending' information to students is most efficient. On the other hand, entrepreneurial skills are acquired via entrepreneurial activities. This calls for leaving the classroom and letting students learn from experience. So, entrepreneurship education has to balance within-class content based learning with organising entrepreneurial activities.

For long, coming up with a business plan and pitching it has been central to the pre-venturing stage of companies, and thus served as a model for entrepreneurship education. However, over time most programmes have moved away from business plan courses. The reasons are, first, that although venture capitalists (and their proxies fools, family and friends) often require such plans, these stakeholders only pay scant attention to them in practice when deciding who to fund. Instead, venture capital looks at such broad financial projections with a large pinch of salt ("we hate those hockey sticks") and pays more attention to the entrepreneurial team behind the business proposal,

and whether the basic idea sticks.³ Second, when funded, entrepreneurs themselves often play little attention to the business plan. The reason is that when entrepreneurs start their journey, often they find out that most market assumptions behind the business model do not stand up to actual conditions.

So instead of having a fully fletched business plan, the current practice is to come up with a stylised version of the bare bones business model, often using in new common language of the Alexander Osterwalder's Business Model Canvas method.⁴ This method describes the business model as an integrated framework of nine building blocks. Central to the approach is to describe the value proposition of the venture through the eyes of the customer. In filling in the building blocks, the starting entrepreneur and her coach can use traditional insights from business theory. For example, a useful analysis of the value proposition starts with simple questions like *which problem are we solving for who?*, *are we in the product or service business?* or *is our value in the price or in differentiation?* These questions are at the core of any strategic management course, so many business professors understand this. The block *customer segments* is connected to marketing theory in which there are many tools on how to describe and analyse market segmentation. On the left hand side of the model, the resource based view of strategic management is especially helpful in analysing how the value proposition is connected to internal and external resources of the venture.

Students struggle most when transferring the strategic positioning of the firm into a viable revenue model. This is the moment when bringing in coaches with market experience is most helpful. In the absence of experienced entrepreneurs as coaches, well-known case studies are useful to prepare students to think hard about revenue models. For example, students know Dropbox as an example of the *Freemium* model. The iPod is great in discussing pricing of service and product combinations. Google can be used as an introduction of two-sided markets. Clearly, such out of reach and common knowledge examples quickly bore entrepreneurship students, so one has to be careful.

3 Noam Wasserman (2012) provides an analysis rooted in many case studies on through which combinations startup teams are likely to be successful. A key insight is also that startup teams need different competences across the startup phases.

4 See Osterwalder (2012) for the original business model canvas (BMC). Over the last three years, on YouTube there are many self-help video's (some really excellent) on how to use the BMC, just Google Business Model Canvas. My recent Google for "Business Model Canvas" returned 4.5 million leads. A similar search on YouTube resulted in 34.000 videos.

On the resources (right) side of the model, it is key to connect the activities and resources to accounting practices and to economic theory. With respect to accounting, it is often wise to instruct students and startup entrepreneurs to use activity-based management accounting as an intermediate step. In this way, the cost structure can be easily connected to the other elements of the business model canvas. For example, in a value chain analysis one can ask what share of the value proposition external partners appropriate. In connection to economic theory, the main question is how the venture's cost structure translates into a competitive advantage. Hence, the would-be entrepreneur should be able to connect the Canvas elements to economies of scale, external economies of agglomeration and to economies of scope, possibly in connection with collaborative partners.

Our experience is that the Canvas works especially well for students with a limited business studies background and with technology startup entrepreneurs.⁵ For the first group, the model provides an efficient way of introducing business models while 'cutting the crap' of bothering the students with issues that are unrelated to startups. A short course modelled on the Canvas often has a clear outcome in terms of a startup idea, a Canvas, and a nice Dragons' Den in which entrepreneurs of the business community participate. For science students aiming to set up technology ventures, the Canvas method is ideal for focusing on the business aspects of the venture and for moving them away from the comfort zone of the technological features of the product or service. For this group of users that have good command over the product or service characteristics, the method is condensed and can be used in a day programme, so that it can be squeezed into the busy schedule of startup entrepreneurs and be used as a team building exercise.

The main intellectual challenge to the Canvas method comes from the Lean Startup movement led by Eric Ries and Steve Blank.⁶ The fundamental critique on the business plan and Canvas model method is that entrepreneurship is learning by action and all about doing, not talking about it and planning. Students and young entrepreneurs should be out talking to influencers,

5 However, for advanced technology students especially those in IT, a more focused book is recommended. A detailed steps approach can be found in Aulet (2013).

6 From an entrepreneurial practitioner's view, Eric Ries (2011) gives a thorough review of the experimental approach to entrepreneurship. In his most recent contribution, Steve Blank (2012) combines the Lean Launchpad approach with the traditional Canvas method.

potential customers and potential investors, falsifying the assumptions of their business idea. The Lean Launchpad method instead stresses that exploration of assumptions can be done in a structured and scientific way, just as with case study research. For example, instead of spending a full course building a Canvas and absorbing lectures on the various elements, the students can come up with a very sketchy idea using the canvas method and are then sent out into the field to verify the assumptions. The method of grading is then not so much on how good the Canvas looks at the end of the course, but what the student has learned, their research findings, and how dynamically those aspects have fed into improvements to the Canvas business model.

The Lean Startup method works especially well for more experienced business students and in pressure cooking environments for dedicated entrepreneurship students. For example, in the MBA setting going over the Canvas elements is rather boring and overlaps with content that students have already mastered in the past. The Lean Launchpad method gives students a chance to test their knowledge, intuition, research skills – together with the business idea – things that most of them like in that phase of their studies. So, business schools more and more move their graduate entrepreneurship courses to action-based skill development and work with student companies.

Further, the Lean Launchpad works well in an incubator setting. Most entrepreneurs, many of them recent alumni of the technology departments, already have some business ideas and the incubator provides an ideal environment for verifying business models in a short period of time and with the help of business coaches. These incubator coaches often feel more comfortable with talking to young entrepreneurs about their experiences than they are with conducting dry workshops on elements of the business model Canvas. For this reason, the rise of incubators and accelerators has propelled the lean startup method to great popularity.

Of the two dominant teaching models, the Canvas model can best be used as a model for technology based entrepreneurship courses and for short day-programmes that introduce participants with limited business knowledge to entrepreneurship. The Lean Startup method is better suited for business students and in the context of incubators and accelerators. However, there are some new developments in entrepreneurship teaching that target different audiences. A first is that entrepreneurship courses are becoming highly popular among creative arts and design students. As design and marketing companies

become more important in consumer driven cities like New York and London and for employment of the creative class, approaches that combine business insights and methods, such as design thinking, of the creative industries become highly popular. An important benefit of design thinking is that it connects better to the psyche of the many creative students and that it is easy to connect, for example, to the Canvas method.⁷

A second recent phenomenon is the increased popularity of entrepreneurship education in faculties where entrepreneurship often is a dirty word associated with rising inequality capitalists conspiring on Wall Street and in the City. Social entrepreneurship is equally popular among business school students as it is with students of social sciences and public administration. There are several branches. Social startup entrepreneurship is setting up companies in which social benefit is the main driving force of the entrepreneur and in which profits play second fiddle. The social enterprise mixes the corporate social responsibility (CSR) course with the corporate entrepreneurship course. The most ambitious is social entrepreneurship as innovative behaviour in the public sector aiming at social innovation. The key thing is that social entrepreneurship can involve the whole university canvas in enterprising activities, which provides massive “traction” for entrepreneurship courses.

BUILDING THE ENTREPRENEURSHIP CURRICULUM AND ALIGNING ACADEMIC STRUCTURES

The previous section dealt with individual elements to be included in entrepreneurship education. A deeper question is how these elements should be combined to deliver sufficient congruence in an efficient entrepreneurship curriculum. Such a programme should ideally take students through three stages: the awareness stage, the engaging stage and the graduating stage.

The awareness stage introduces entrepreneurship elements to the curriculum. It serves two main purposes. The first is to trigger a latent desire in students who have an entrepreneurial mindset, but have not yet considered entrepreneurship as a goal in their life. The second is a selection purpose. Entrepreneurship

7 The most famous of these books is IDEO's Tim Brown (2012) on design thinking in general. The most popular self-help guide in the field is by Jeanne Liedka and Tim Ogilvie (2011).

education is not cost-effective or for all. So, it is important to reduce the number of students in future dedicated entrepreneurship courses by making the uninterested and untalented to vote with their feet.

There are several approaches to the awareness stage. The most simple is to introduce a specific course on entrepreneurship that combines the fundamentals of business startups with respect to finance, legal aspects and marketing with attitude as well as skill elements like team selection and opportunity spotting. Another approach is to embed entrepreneurship elements in existing courses. For example, systematically asking valorisation questions about social impact of scientific research from science students may trigger entrepreneurial desires in the students. Lastly, an emphasis on extracurricular activities, guest speakers and committee work can also trigger the entrepreneurial mindset in students.

Awareness courses build on action learning are likely to be more popular with large groups of students unfamiliar with entrepreneurship. Three examples illustrate the elements of such “entrepreneurship challenges”. Organise a day in which each team of students gets 5 euro in seed funds and has to make money with that in the city centre (print T-shirts for them with a cool name, do not forget a Twitter tag for the pictures). No limitations, and be surprised how many beers they can buy in the evening using their profits. The Rock is a game where students have to make a business plan on what to do with an unspecified amount of rock from the moon (forbid only the start of a restaurant exposing the rock). Be amazed how many diseases moon rock can cure, and bring in a professional artist to paint their business ideas quickly and hang them on the wall. Thirdly, there are by now many simulation business games that students love to play on their smart-phones. Project the running scores on a large video screen.

The second stage is that of engaging a small subset of students more deeply into dedicated entrepreneurship courses and activities. Two approaches gain in popularity. Within business schools, it is fashionable to work with student companies in the curriculum and combine this with a student incubator. Examples are Harvard Innovation Lab (250 student companies each year) and the technology entrepreneurship programs at MIT. Also in Europe such structures are becoming more popular. At my Utrecht home base, in the last three years we have introduced popular student companies in the curriculum and setup an incubator called StudentsInc. Another route is the creation of learning labs. For studies that are further from entrepreneurship, setting up a structured learning environment connected to the incubator in which students,

companies and staff cooperate in making company business cases is a good first step to make students work on entrepreneurship. Companies can offer guidance about markets and products that they would like to explore. But also there are products and services for which they would like to act as a launching customer.

The last and very important stage in the curriculum is to make it possible for students to graduate on their startup company. This is not easy, as most science universities require a thesis to graduate. Often it is a stretch to combine this thesis with the startup company. For science students, a way out is to write the thesis on the intellectual achievement behind the business model in terms of IP. For business students, the professors are sometimes more lenient and allow marketing research in scientific manner to qualify. An innovative way is to really structure the explorative customer development stage to qualify as qualitative case studies. In technical universities and universities of applied sciences graduation involves the signing-off of competences. Hence, graduation of startup venturing should go together with the proper documentation of such competence development. For this, one strategy is to connect the supporting staff of the incubators to university professors. Proper coordination between these groups can avoid many problems for graduating students.

CREATING ENTREPRENEURIAL OPPORTUNITIES FOR STUDENTS

Creating an entrepreneurial curriculum clearly is not sufficient to promote entrepreneurship. Of crucial importance is that universities actively engage in creating entrepreneurial opportunities for their students. This section discusses a non-exclusive set of determinants for success in this area. To start, a highly underestimated element is to formulate an entrepreneurial vision and mission statement for the university. As in business, such mission statements serve two goals. First, they act as a selection mechanism to evaluate choices in operations, certainly in the budgeting and personnel allocation stage. Hence, when staff chooses to engage in entrepreneurship education and research, they feel that the organisation has a long-term commitment to this goal. Second, it communicates values that signal that the university is an interesting partner for outside companies in the region. When the university commits to entrepreneurship and applied research, this signals to the business community that it is investing in resources that are complementary to their own RDI spending.

Another step is to create a membrane between the graduation stage and high growth entrepreneurship in the region. On top of the student company and incubator programmes, entrepreneurial universities need well-funded and managed public incubators for real-life entrepreneurs. Such incubators should not be overly mixed with student activities, as the entrepreneurs in these incubators often have a desire to leave student life behind, or have to be pushed that way. Also, it often is best to open up the university incubators to entrepreneurs with more experience from outside who connect well to the research priorities of the university. In this ecosystem there should be ample “white space” for seed capital from banks, angel investor clubs, and senior “entrepreneurs in residence”.

A third element is creating a vibrant business community around the university. Several steps are standard but effective. Organising master classes for business staff and excellent students combined with network events are often well appreciated by the regional business environment. Universities should invest in an entrepreneurial alumni program using professional tools like SalesForce and social media, with greatly facilitate information transmission to this important but elusive community. However, when organising these events, universities and public institutions should realise that they should never aim to be at the centre of the entrepreneurial community itself.⁸ Instead, universities should actively engage in promoting and supporting entrepreneurship events organised by the business community by facilitating speakers, and by helping out financially underfunded private entrepreneurship events. Further, universities should understand that business is most interested in the university’s students, and that university-business cooperation does not work without involving the students.

Then there are two deeper issues. The first is that university entrepreneurship is connected to city agglomeration dynamics.⁹ There is a recent fast growing research agenda that connects entrepreneurship to city growth. Entrepreneurship is triggered by opportunities, which in turn are triggered by structural change and agglomeration. Because the external economies of agglomeration are an important engine for economic development and change,

8 See Brad Feld’s (2012) account of the Boulder entrepreneurship community on this point. In his view, universities should facilitate the business community, not run it.

9 This point is brought home in Glaeser (2012), in which he celebrates the rise of cities as a result of entrepreneurial success. His main theme is that people cluster together to share ideas and innovate, which seeds entrepreneurship.

this connects entrepreneurship to changes the city's economic structures. As cities are the new engine for innovation through creative destruction in a post-capitalist knowledge-based society – and also in creating a consumption-based society – they offer plenty of entrepreneurial opportunities. For this reason, universities should connect their specialisations, applied research as well as entrepreneurship education to the city's entrepreneurial dynamics.

The last issue is that universities should realise that the public sector is an important element in innovation and private entrepreneurship.¹⁰ Often, the popular misconception of the entrepreneur as a dropout in the garage still dominates, together with the heroic stories of Steve Jobs, Richard Branson and Mark Zuckerberg. But many of these entrepreneurs make clever use of university research that they commercialise brilliantly. One of the biggest current political tensions is between the social construction of innovation with public money and the immense individual private wealth that comes from it through entrepreneurial appropriation. So, on the one hand universities should engage in research that is complementary to business activities, but on the other, universities should be commercial themselves to avoid supporting private wealth through taxpayer money.

CONCLUSION

In this article, I have argued that delivering entrepreneurship education that yields results is a complex task. It involves choosing an approach (transfer or experimental) and it should align stages (awareness, in depth experimentation and graduation/incubation). Further, entrepreneurship education should be connected to the local business environment by having a clear mission, moving towards applied research, and setting up business and alumni communities. But so far these are all hypotheses. What we are lacking is clear evidence on how the different kinds of educational approaches connect to labour market outcomes. In addition, we are in need of systematic analysis and benchmarking of university-entrepreneurship interaction and best practices. Clearly entrepreneurship education is practical, but more research on the effects of it would be helpful.

10 The See Mariana Mazzucato for a critical review of startup entrepreneurship in innovation. Her claim is that publicly funded fundamental research is at the core of most entrepreneurial success stories like Apple, Google and Silicon Valley at large.

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PROMOTING ENTREPRENEURSHIP AT TURKU UNIVERSITY OF APPLIED SCIENCES

Ella Kasi

Promoting entrepreneurship has been a key strategic priority at Turku University of Applied Sciences throughout the 21st century. According to the national decrees relating to universities of applied sciences, we are obligated to provide students with the skills required for work as independent experts and entrepreneurs, and to participate in the development of the work community. Presenting entrepreneurship as a career option to our students is therefore an important task, which is reflected in the innovation pedagogy we have chosen as our strategy.

In an increasingly complex world, the demand for entrepreneurial expertise is on the rise. The impending generational change following the retirement of the baby boom generation highlights that demand. Turku University of Applied Sciences offers a specialisation programme in entrepreneurship, which equips students with a solid knowledge base for entrepreneurial activities. TUAS additionally offers a Succession School designed for young people taking over businesses from the older generation.

Entrepreneurship is full of opportunity. Now, it is possible to integrate the process of planning and establishing a business into higher education studies. TUAS degree students have the opportunity to acquire a great deal of information and many skills related to starting and running a business. Several student cooperatives, i.e. businesses established by students, operate within TUAS. Teachers from different fields supervise the cooperatives while experienced entrepreneurs serve as coaches. The students also have the opportunity to network and establish contacts with entrepreneurs and other students interested in entrepreneurship. Such contacts are vital to everyone.

We study and develop innovative services, products and entrepreneurial activities in order to enhance business and welfare in our area. To promote innovation activities and entrepreneurship, Turku University of Applied Sciences conducts close cooperation with entrepreneur associations and businesses, particularly in the region of Southwest Finland. Such cooperation comprises both research and development. The work is often based on a strong theoretical foundation that promotes further development. Modern enterprises need innovation that extends beyond business ideas. Turku University of Applied Sciences can offer multidisciplinary and pragmatic RDI and services for the purpose. Students generally play a big role in the practical implementation of projects. Their activities are always supervised by our experts so as to guarantee successful results. Joint projects are invariably learning projects aimed at generating new competence all round.

Our diverse entrepreneurial cooperation includes entrepreneur and entrepreneur mentor networks that offer students a forum for discussing entrepreneurship related matters and challenges. Vice versa, we offer entrepreneurs a direct *Entrepreneur Channel* to Turku University of Applied Sciences' expertise in different fields. Through this medium, enterprises can find students to complete commissioned theses, or interns and summer workers for projects, marketing, business development, product development, and customer satisfaction surveys in their field of studies, or for utilising social media.

The cooperation between the entrepreneur associations in Southwest Finland and Turku University of Applied Sciences includes partnership agreements with the aim of planning joint training, improving communication in both directions and better securing internships for our students. The agreements additionally obligate TUAS to both anticipate and to react to the expertise and service needs of entrepreneurs. TUAS has an advisory board on entrepreneurship. The goal of the board is to promote entrepreneurship and cooperation and develop study paths related to entrepreneurship.

Modern professional communities value the entrepreneurial spirit and cooperation skills. We can exhibit entrepreneurial spirit while working for others, too. Professional communities value the entrepreneurial qualities TUAS diversely helps to develop: motivation, enthusiasm, the desire to learn, initiative, confidence, determination, faith in personal ability, courage, and the

ability and skill to do the right thing in the right place at the right time – the ability to take responsibility for one's activities and their further development by regarding your workplace as though it were your own company.

Turku University of Applied Sciences generates many types of value for companies and entrepreneurs. Reciprocally, the enterprises in the area generate additional value for TUAS through partnerships. The better TUAS is able to react to the signals and development needs of the professional field in cooperation projects, the better our chances of promoting the development of student expertise to correspond to actual working life requirements.

Below, we will briefly describe two typical cases of promoting entrepreneurship at TUAS.

SPARK FOR ENTREPRENEURSHIP

University of applied sciences students often envision themselves as employed by a company or holding a public office after graduation. This was established nearly a decade ago, in spite of the fact that TUAS has offered a specialisation option in entrepreneurship since it launched its Degree Programme in Business Administration. While an entrepreneurial approach and internal entrepreneurship were always on the agenda, TUAS programmes did not really present entrepreneurship as a career option.

Since the very beginning, Turku University of Applied Sciences has planned and developed studies that correspond to business needs on the basis of feedback received from actual businesses. After such communication, we invited the influential generation of Turku entrepreneurs to come up with ideas for introducing entrepreneurship as an attractive career option among students. Back then, the times were not far behind when 'entrepreneurism' was practically a swear word and conjured uninviting images.

Policy makers and successful entrepreneurs in the Turku area could see that recounting entrepreneur stories and introducing entrepreneur personalities would be a simple, efficient way of introducing entrepreneurship to students. This simple thought determined the structure of the Spark for Entrepreneurship

seminar series. The goal of the seminar series is to provide students with examples of strong entrepreneurship in order to activate creative thinking and the entrepreneurial spirit in them, and to ignite their spark for starting their own businesses.

Seminar events are organised four times a year. The target group comprises students in all our fields of study, from health care and fine arts to business administration and social services. The events are aimed at attracting entrepreneurs from different fields to give everyone the chance to envision their specific entrepreneurial potential. The participation of different entrepreneur age groups is crucial for securing a varied palette of experiences and views. This means the group of entrepreneurs will complement each other and inspire new perspectives. We additionally aim for a gender balance.

In the first few years, the then Business Development Manager at the Turku Centre for Regional Development offered us the benefit of his extensive expertise by hosting various events and conducting interviews. Such tasks have more recently been taken over by a representative Varsinais Suomen Yrittäjät (the entrepreneur association in Southwest Finland).

Entrepreneurs come to the events to recount their personal entrepreneur stories and to answer student questions. When a group of entrepreneurs exchange views, they offer a realistic view of the challenges and rough patches of entrepreneurship as well as the related survival strategies. Entrepreneurs are wonderfully open. They are not afraid to point out their personal defects. Bankruptcies and the underlying reasons have been addressed at our seminars.

Students compose essays on the basis of the events, sharing their feelings and thoughts about entrepreneurship. Their accounts have shown us that while the Spark for Entrepreneurship seminar model is relatively simple, it has remained functional. The essays indicate that the spark for entrepreneurship has indeed ignited in the minds of many students. Sometimes, very basic things matter: one student reported to have seen a real life entrepreneur for the first time at a Spark for Entrepreneurship event.

TUAS SUCCESSION SCHOOL

In the period from 2005 to 2007, the Finnish Entrepreneurship and Innovation Network for Higher Education conducted an entrepreneur Succession School pilot project in Lahti. In 2007, the project was launched in Turku. Statistics from the time told a familiar tale: the current generation of entrepreneurs is growing old and businesses need successors.

So, we investigated to see if there were children from entrepreneur families among our students, if any such businesses needed successors, and if the students would be up for the task. The answer was yes to all three questions! In direct response to a business development need, we launched a campaign to recruit students for a Succession School aimed at implementing generational changes within companies. The Succession School has since transformed itself into a training programme targeted at students who are interested in acquiring an established business.

The objective of the Succession School was clear: to provide tools for generational change for both current and future entrepreneurs in order to secure the successful continuation of a business. In other words, the objective is to provide the current and following entrepreneur generations the opportunity to plan and implement a controlled change, secure the continuation of profitable entrepreneurship, and guarantee the regeneration of business operations.

The first step in the programme involves mapping out student entrepreneur profiles. The profiles help the students to understand their resources and points of improvement and to apply admission into specific training. Implementing the change of ownership is a time consuming multi phase project for both the enterprise and the entrepreneur. The Succession School diversely covers different aspects related to ownership and generational change, including legislation, taxation, funding, risk management and valuation. The programme is implemented in cooperation with public business organisations and companies in the Turku region. They provide the practical expertise required for the programme.

If a student has a target company in mind, they begin the training by mapping out the conditions for the operation of the business, complete with a business and environmental analysis. These serve as a foundation for analysing the factors contributing to the success of the business and for developing business models – for finding the keys to securing the profitable continuation of the

business. The programme specifically focuses on preparing the students to take over their chosen business, be it their family business or an acquired company. The training largely focuses on company specific solutions. If necessary, consulting services may be requested from other organisations.

Thus, the company facing a change of ownership participates in the implementation of the training programme. If the company is to be taken over by a student who is a member of the owner family, he/she is likely to hold a certain level of company specific expertise. In the event that a company owner has only just begun to look for a successor, the multidisciplinary nature of TUAS offers extensive resources for finding the right person from among our students.

BUSINESS ACADEMY – AN ENTREPRENEURSHIP-ORIENTED LEARNING ENVIRONMENT

*Jaana Kallio-Gerlander, Jussi Puhakainen, Mikko Määtänen &
Pyy Kunnas*

Student cooperatives teach real working life skills and thinking through project work. Project implementation is supported with multiform learning in workshops, book clubs, training events, seminars and through virtual learning. A working-life-oriented learning environment helps to develop thinking and doing, and dedicated support is provided by the team and team coach. The primary focus is initially on developing the “mindset” thinking, followed by the “skill set” that is chosen after the learning needs identified in a customer project.

BACKGROUND

The Salo Campus of the Turku University of Applied Sciences introduced a new specialisation option based on team working in August 2011, which became to be called *BisnesAkademia* (The Business Academy). The entirely renovated learning environment offered new premises for three student cooperatives comprising students of business administration and computer science. The teams were *Zemi Finland OSK*, launched in 2004, as well as two new student cooperatives, *Proodo* and *Meilo*.

The premises resemble more those of a modern expert organisation than a traditional university. The teams share a large open office space, designed by the teams themselves. There are also some smaller conference rooms, a relaxation area for eating, drinking or watching films, and a brainstorming room, or “the box”, for book circles and training events. Today, Business Academy is home for seven teams with approximately 150 students.

Microsoft's TechClub, a student-led learning environment for information and computer technology, and MarketingClub, run by two expert teachers, operate on the premises of the Business Academy as well. In addition, there are expert teachers available to assist in communications and the implementation of different software applications as well as to provide general guidance. The principle for having expert teachers is that they are available when there is particular need for guidance.

A NEW ASPECT TO TEACHERSHIP – THE COACH

Each team has a dedicated teacher called *coach* and a mutual assistant coach. All coaches are experienced in both expert and student team work, but running some studies as team work at the university level is new even to some of the coaches. The coach's role in the Business Academy may be to provide support and coach the cooperative students; the coach's duty is also to make sure that the students maintain focus on their studies. The coach supervises, motivates, counsels, guides and supports the team members. The coach is not a team member but provides indirect leadership to his or her team while coaching them as people and learners. The coach does not manage the running of the cooperative but motivates and offers different aspects to managing things and supports the students' own thinking.

The coach is an expert in some area of business as well as in learning (Hakkarainen et al. 1999). Comparison with a sport coach is telling – a coach has played sports at some point in his or her life, but being a coach means he or she no longer plays. The team members' attitudes towards the coach are more straightforward than in a typical teacher-student setting. They feel their relationship with the coach is more natural than usually with teaching staff. It is easy to cooperate and be oneself with the coach. Interaction is also at a different level than traditionally, when the teacher's authority was predetermined and leadership took place at the front of the classroom, from a designated pedestal. Interaction with the coach is almost daily, and communication is easy. The coach has an overall responsibility for his or her team.

The coach is actively involved in daily activities and maps out possibilities for development based on what and how each student wants to learn and increase his or her competence. Everyday work emphasises the coach's metacognitive skills – social skills and skillfulness, holistic vision and linking different things

together, tolerance of insecurity and the ability to solve problems (Hofstede & Hofstede 2004). The field of education will in future become an even more integral part of work than what it is now, and vice versa. That will place more emphasis on unlearning old and experimenting with new. New teachership entails change, and change entails learning. When people learn, changes take place in their thinking and internal operation models. Subsequently, changes will begin to take place also in the work setting (Rauste-von Wright & von Wright 2002).

In addition to coaches, there is an assistant coach working with the cooperatives, who is junior to the full-time coaches and has either graduated from the academy or is a senior team member. He or she will be present daily and has his or her own experiences of the everyday life of an academy student. Peer support is one work function that describes the role of the assistant coach. The assistant coach is not responsible for the teams.

NEW VERSATILE LEARNING ENVIRONMENT IN MULTIDISCIPLINARY TEAMS

Team-based learning has long traditions in Finland. It has been tested and developed, among others, in universities of applied sciences at Tampere and Jyväskylä as well as elsewhere in Europe, including Mondragon in Spain and Haarlem in the Netherlands. Speakers for socio-constructive learning have included Dewey (1897) at the end of the 19th century and also Gibbs et al. (2007) and Kyrö (2011) in her latest studies. Salo Business Academy has striven to discover the most functional aspects of team learning from past models that can also be integrated into business life, and combine them with the MIT Media Lab idea on continuous regeneration, use of technology and orientation on work life. Business Academy takes the view that learning occurs everywhere, not just in a specific place or building such as school or educational institute.

Business Academy has created its own model for the development and regeneration of learning and its environment, which follows the practices of innovation pedagogy at Turku University of Applied Sciences (Kettunen 2009). In practical terms this means that learning takes place in consideration of working life needs and that learning is intertwined with regional networks.

At the start of their studies, a tailored personal study plan is drafted for all students. In addition, each team member drafts a learning agreement that brings forward his or her own targets and how they will be achieved, either in writing, using images or graphics. The student's own learning is described in a portfolio, which can also be electronic. This makes it easier for the staff to recruit new trainees and employees, assess learning and identify learning objectives.

The theoretical foundation is built by reading approximately 20 books and 5–10 articles a year, including both scientific publications and newspapers. The information is shared in book circles among the team. Training events also deal with theory, projects and their process or finding solutions to matters relating to the project together. The team members also acquire information and create networks by attending local and national seminars and workshops, such as events organised by businesses and business associations. They can also learn virtually using the university's own materials or materials available on the internet.

An example of a learning situation oriented on working life is the *24h* or *48h innovation*. These refer to a challenge or problem offered by a business or another body that is introduced to the team by an external commissioner. Depending on the scope of the commission, the teams will have either 24 or 48 hours to work on the challenge and present a solution to the commissioner in the end. Usually, all teams work on the challenge and are able to see each others' suggestions in the debrief, as well as which team's suggestion is considered the best and awarded a financial reward. Feedback from the other teams, the commissioning party and coaches provide an extensive picture of the student's own and the team's skills, not to mention developing and expanding networks in this way.

Workplaces are practically already laboratories for new learning without limits. Everyone is expected to take responsibility independently for maintaining and developing his or her own learning and networking – keeping in mind, however, that working in teams helps to achieve the best results. In any case, different individuals' different concepts on learning must still be taken into account, which requires individualising the work in the curricula – for example by offering alternative completion methods. This will one way or another include learners outside the mainstream, such as those specialising in some tightly restricted field, quick learners or those who set up their own business already during the studies.

Team learning offers the student the possibility to direct his or her skills independently and select projects that are of personal interest. Portfolios compiled of such projects are students' "business cards" when moving on to employment. The employer will, after all, be interested in the applicant's skills and previous work, and not necessarily which university the applicant graduated from and with what grades.

Creating a certain kind of state of mind and attitude (Gibb 2011; Kyrö 2011) as well as taking responsibility for one's own learning play a key role in team-based learning. This is where we talk about creating a "mindset". Business Academy operates by putting the "mindset" first; this and the right commissions as the starting point later builds the theoretical foundation and skills that, for their part, will form the "skill set". The difference with the traditional learning concept is, effectively, that working through the requirements of learning and commissions will build the skills level, not the other way round. This will obviously need to be communicated clearly to the working life clients. Once the motivation to learn new things begins with the students themselves through understanding the requirements of working life, acquiring skills will also become quicker and more meaningful.

Not everyone will necessarily turn into entrepreneurs in the exact sense of the word, but entrepreneurship is also manifested as intrapreneurship within an existing organisation. An intrapreneur has the same attitude towards his or her work as an entrepreneur: enthusiastic and proactive, responsible and making a difference while considering the big picture. Intrapreneurs have confidence in themselves as well as the work community. They perceive change as an opportunity – and intrapreneurship supports the work community during times of change. For managers and supervisors, on the other hand, it offers new management tools and methods. (Kyrö et al. 2006).

THE SEKAISIN SALOSTA CITY EVENT AS AN EXAMPLE OF WORK WELL DONE

The Sekaisin Salosta ("Mad about Salo") event, organised annually since 2010, is a good example of the students' ability to take self-directed responsibility for a project. The event was initially a city event that included happenings throughout Salo, but that subsequently developed into its present form as

a lifestyle fair. The event producer has been the student cooperative Zemi. The project started when Business Academy was approached for assistance to reform the outdated fair concept. The reason for the format change from a city event to a lifestyle fair was first and foremost based on realising the commercial potential of the event. The event proved a success right from the start.

A core team of two students has annually accumulated other students and student cooperatives to organise the event as well. Duties have included participating in selling exhibition space, designing the fair venue and other practical work relating to the event production. The greatest benefit of the event has probably been spreading the entrepreneurial spirit of the core team among junior students – they have been able to see what responsibility and absorbing risks mean in working life through practical actions.

The project has also increased regional awareness of Turku University of Applied Sciences and highlighted the student entrepreneur model, promoting entrepreneurship. In addition, the partners of the successful fair project have approached Business Academy with new project offers, and several articles have been published about the students in major local newspapers. Ample positive publicity, for its part, eased the sales work of new projects of the cooperatives.

SUMMARY

The learning environment described above gives employers a smooth access to recruit students. As early as the second year, students are working with authentic commissions. When students realise that projects are carried out for a real partner that has invested their own money and time into the commission, they see the projects as serious matters, and not just a traditional case or exercise. A successful and carefully executed project can generate further cooperation, including a financial reward for those working with the project, which motivates students even more. For its part, this gives the commissioning party the chance to meet the students and discuss with them in a different way and at a different depth than in a traditional learning situation.

Most projects are carried out in groups, which will test the student's social skills. Getting results in working life depends on the individuals' ability to take and give space, share and carry responsibility. This manifests to the working life representative at a very practical level in the 24h and 48h innovation events, where both the "mindset" and "skill set" become evident.

Studying at the academy is something between studying and working. Since the student cooperatives formed by the students operate as real businesses among other real businesses, the students have a very natural access to working life environments. The cooperative activities also teach concrete skills in addition to the attitude, such as sales and presentation skills as well as skills for independent thinking and networking. Many students experience the transfer from university studies to employment as difficult, and finding employment after studies is not plain sailing. However, the corporate world is not quite so alien to a team student. Team entrepreneurship also lowers the student's threshold to become an entrepreneur, as academy work works as a smooth descent into occupational life. At its best, Business Academy produces students with exactly the right kinds of "sets", and individuals who are already accustomed to the operating ways of the corporate world.

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CHANGING ACTIONS THROUGH CHANGING STORIES

How understanding narratives can improve
business support for High Growth Firms

Zuleika Beaven & Jonathan Lawson

INTRODUCTION

In this article, we explore the role of entrepreneurial identity, narrative and restorying for education programmes that support business growth. Drawing on identity theory and the relationship between personal and dominant narratives of enterprise, we argue that, alongside more established approaches, there is a need for programmes to support the development of a robust entrepreneurial identity. This can affect entrepreneurial actions and enhance business development and growth, and calls for innovative pedagogic approaches such as those outlined here. In our discussion, we present one entrepreneur's story to illustrate this.

Reflecting the growing conception of entrepreneurship as social actions, rather than a purely economic phenomena (Steyaert & Katz 2004; Gartner 1989; Cope 2005), the role of the entrepreneur in business growth is argued (Wright & Stigliani 2013). At the same time, experiential rather than content-focused enterprise pedagogies have become established (Brockhaus et al. 2001). We draw together these developments and, based on our experience, argue for the need for further innovation in enterprise education that places the self-identity of the entrepreneur or aspiring entrepreneur at the core of the curriculum. Whilst our experience is with HE-based programmes for owners of established businesses, we contend that this approach has a wider relevance with graduate entrepreneurs and students in “for-entrepreneurship” programmes.

The approach argued in this article comes from continual knowledge exchange between staff in the Centre for Enterprise at Manchester Metropolitan University (MMU) around our high growth programmes for small business owners (SBOs). The authors bring different perspectives to this. The first author is an applied researcher who has been undertaking narrative interviews with the owners of businesses in our growth programmes, while the second author is an academic responsible for delivering growth programmes to small business owners.

IDENTITY AND NARRATIVES OF ENTREPRENEURSHIP

Students on entrepreneurship programmes, graduate entrepreneurs and small business owner-managers do not exist in isolation, but live and work in the context of dominant narratives of enterprise. Martin et al. (2007) argue that individuals form a model about enterprise and see themselves in relation to it. This is mediated through self-efficacy and shared stereotypes – from family, community, the media and so forth – that form the *dominant narrative* of enterprise. Various studies have found this narrative to involve traits and metaphors such as: superhero, battler, force for change, warrior, rogue, adventurer (Nicholson & Anderson 2005); hero, economic saviour, brave, ambitious, successful (Down & Warren 2008); self-made man (Cohen & Musson 2000). In a study across six European countries, Anderson, Drakopoulou Dodd and Jack (2009) captured metaphors used by students, teachers and others in a school environment to understand entrepreneurship. The most frequently used, by a substantial margin, were metaphors associated with predators. So what is the significance of these understandings of enterprise? Down and Reveley (2004) define entrepreneurial identity as the way that owner-managers see and talk about themselves as entrepreneurs, and that this is a guideline for action and a means of security. In other words, this context is highly relevant to their future entrepreneurial behaviour.

It is argued that the dominant narratives of the aggressive, driven, successful entrepreneur can be alienating for those aspiring to or engaged in entrepreneurship. Cohen and Musson (2000) found that female entrepreneurs in their studies had a sophisticated and at times contradictory sense of the aggressive image of entrepreneurs and their own entrepreneurial self-identity. Similarly, Warren (2004) found that women in her study did not initially

characterise themselves as entrepreneurs, but rather began to assimilate this identity through engagement with social networks. This problem of identity can have a negative effect on self-efficacy and on action (Down & Reveley 2004).

In their analysis of the nascency journey told in the book *The Republic of Tea* about the founding of the successful US tea company, Korsgaard and Neergaard (2010) note that repeated enactments of the emerging venture support continuous identity formation. In this journey, they argue, we see the founders struggling with their entrepreneurial identities and the importance of its role. Johansson (2004) sees entrepreneurial identity as playing an active role in the formation of new businesses and links how entrepreneurs tell their story and how they run their business. Alienation from dominant narratives, however, can lead to personal narratives in business owners that suggest they cannot be a “real” entrepreneur, because they are not like the dominant notion of entrepreneurs.

So, if stories of enterprise are an important component of entrepreneurial self-identity and if these stories are affected by a sense of alienation from the dominant narrative, restorying presents an interesting way forward. Restorying is the retelling of stories – about ourselves and about others. Kenyon and Randall (1997) describe it as the “literary process of re-composing the stories we have ‘made up’ about who we are, where we come from and where we are headed”. The metaphor of a river accurately illustrates the constantly changing nature of our life stories as they unfold, both through time and through re-viewing of past events. This process can have multiple applications, including therapeutic. Restorying through a high growth programme, therefore, is co-authoring between entrepreneur, researcher and tutor (Hawkins & Saleem 2012). It is the co-creation of new, personal narratives of entrepreneurship, and it is discussed in the next section in relation to our practice at MMU.

STORYTELLING AND RESTORYING IN A HIGH GROWTH PROGRAMME

Our own experience of restorying personal narratives is within a prestigious international programme supported by a large private sector firm, which aims to develop small businesses’ capabilities to support high growth and new

employment. The programme has a highly competitive intake of 30 SMEs and social enterprises per cohort. It comprises a combination of teaching in workshops, action learning sets and one-to-one activities over 6–12 months plus follow-up activities post-programme.

Participants are drawn from across the North West of England, including the major metropolitan centres of Great Manchester and Merseyside. The small businesses are at least 1 year old and must have the potential for growth. They come from a wide range of sectors including service, high technology, manufacturing, creative industries, retail and construction. Innovative pedagogy is central to delivery and embedded in the programme are a number of activities that support storytelling and restorying as part of the development and strengthening of an individual entrepreneurial narrative. This process begins with the *3 Objects* session (taken from work by Charles Handy), for which the small business owners bring along three objects that are metaphors for their story (Handy 2007). Presenting to the group, they use the objects to talk about how they see themselves, how friends and family see them and their hopes for the future. Objects used at past sessions include:

- juggling balls and a Rubik's cube, illustrating the complexity of the role
- a football shirt, used by one SBO to demonstrate that his company are his team
- a Halloween mask, to show how scary the role can be
- an empty wallet, as a metaphor for financial risk taking
- objects such as a golf ball or a "Gone Fishing" sign, used to sum up a vision for a future when the SBOs would be able to step away from a self-sustaining business.

This activity sometimes involves owner-managers revealing feelings that they are "not doing it right", e.g. a fear of risk-taking, desire to work less, strong camaraderie with the team rather than being a tough boss, and not making much money. Stories are often recognised and supported by the audience, allowing the group to begin to challenge established notions of what being an entrepreneur is meant to be like. This group undermining of the dominant narrative is the first step in building new personal stories of enterprise and an emerging entrepreneurial identity. This is followed up by more specific input challenging what an entrepreneur for instance "is" or "does" (Martin et al. 2011), requiring attendees to explore how they see themselves.

As well as specific activities such as this, core activities in each session include structured reflection through storytelling. The Finance and Accounting classes include elements of telling of financial stories of the business, and the Leadership class encourages the sharing of stories of leadership. Through these activities, the tutors encourage development and practising of personal narratives of enterprise, exploring issues of perceived conflict with dominant narratives.

Essential is the peer support and “norming” of these personal stories of entrepreneurship within Action Learning Sets. These are small groups formed within the cohorts, where much of the group work takes place. Action Learning Sets are encouraged to form links and work outside of taught sessions, and have tended to continue after the formal programme has ended.

MARTHA'S STORY

To illustrate the restorying journey and the importance of supporting the development of a strong entrepreneurial identity, we present the story of a female entrepreneur based in Bolton, a large post-industrial town in the Greater Manchester area.

She attended the main Centre for Enterprise growth programme and maintained her link with MMU for two years. She was passionate about her business, her talent as a salesperson and the quality of the service that her company offered customers, but she was equally clear about not seeing herself as an entrepreneur:

I never tell anybody I am an entrepreneur, for me it is quite embarrassing. I never class myself as an entrepreneur, for me an entrepreneur makes millions and millions in money and does something fantastic.

She talked of how her original vision was limited and focused on personal goals:

When I first set out I had no idea, I didn't even have a vision of employing anybody, I just wanted to see if I could do it.

Martha went even further in her self-deprecation, playing down her business achievements before joining the programme and describing herself as a “Numpty from Bolton”.

We felt differently. We saw a strong, scalable business with an owner who needed to stop thinking of herself as the best salesperson on the team and start thinking of herself as a leader. Martha had built a strong team and had excellent staff retention rates, and now she was ready to do bigger things. Working through taught sessions, with her growth group and with her tutor, Martha began to see herself as a leader and to restore her experiences; at the same time, she began to make changes in her company. She appointed trusted and long-term staff to senior posts, allowing her to step back from sales. She also employed new sales and administrative staff, and moved to much larger and smart new premises in the town centre. These changes gave Martha the space to focus on the strategic and leadership aspects of her role and to concentrate on top clients.

That journey was not always easy and there were risks and sacrifices, as Martha says:

It's been very scary! I had three new people and no income coming in to pay those salaries, so frightening – but BRILLIANT!

The result, however, is a growing company with a strong strategy and a robust growth plan:

We've taken three people and we've given them a job and we did it because we have the plans and we know we can make it work.

Martha has noticed how, as a result, the company has increased its profile and reputation: “Everywhere I go, people know my firm.” She has not lost her initial vision of offering a high quality product or her focus on her team. Instead, Martha is incorporating this into finding and building her own personal narrative of entrepreneurship:

I am just me, it doesn't make any difference whether it is [in Bolton] or I've got an empire, I love what I do and I love my team.

But at her final class, Martha had a clear message for her cohort and tutors: “I now believe I am an entrepreneur!”

CONCLUSIONS

In this article, we have considered entrepreneurial identity and how it is developed through narrative and restorying. Using a specific example from one programme at MMU, we have demonstrated some mechanisms for identity development through soft interventions, such as space for storytelling and restorying within a group of entrepreneurs.

The example of Martha's story shows how even an owner of a growing business can struggle to relate to an entrepreneurial identity which is dominated by notions of aggression and exceptional success. We have demonstrated, however, that the soft interventions in our high growth programme have been a catalyst for restorying her personal narrative of entrepreneurship and growth.

But why do the owner-managers restory within our high growth programme? We think the effect of peer audiences, reinforcing and authenticating experience is vital. We also think peers have a key role in allowing emotional risk-sharing within the group, providing a relatively safe environment for exploring and shaping new identities. And why is this important in a high growth programme? Martha's story is one of many in our study that demonstrates how identity affects actions, how the development of a personalised, entrepreneurial identity can support actions for growth. Identity is central to the understanding of behaviour and choices made by individuals and groups. A well-developed identity, validated by experiences and the acknowledgement of others, is a guide to action and a means of decision-making (Albert 1990) and is important to our sense of self, and of social position (Mishler 1999). When considering the "public self" as recognised by others, self can be represented through the attitudes, intentions, roles and values that a person holds or acts out (Erez & Earley 1993). So, when engaging in the demanding and risky actions associated with initiating and then sustaining high growth in a small business, a robust sense of self-identity is key and an essential part of any enterprise-focused curriculum.

We have used a single example here, drawing on one of a number of programmes run at MMU with small business owners. We believe, however, that there is a much wider significance to the importance of developing entrepreneurial identity in programmes, and the role of narrative and restorying. We argue that consideration of entrepreneurial identity and the place of personal stories

within the context of the wider, media-driven dominant narratives of enterprise is an important part of for-enterprise education, be that with business owners, incubation tenants, graduate entrepreneurs or in “for-entrepreneurship” student programmes. Furthermore, our experience suggests that supporting robust identity development within programmes requires the use of innovative pedagogic approaches such as the restorying activities integral to the growth programmes at the Centre for Enterprise.

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